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Vacation Time

The INDUSTRIAL-ARTS MAGAZINE wishes all its readers a most enjoyable vacation time. May this vacation, whether spent in work or play, assist you to build up a surplus supply of mental and bodily vigor that will help you to surmount all difficulties during the coming year.

Lest You Forget

Any reader who contemplates changing his address, either for the summer months, or for the coming school year, is earnestly requested to notify the circulation department of the INDUSTRIAL-ARTS MAGAZINE.

Do not forget to give your present address as well as the new address.

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THE INDUSTRIAL ARTS MAGAZINE

Volume XVII JULY, 1928 No. 7

STANDARD PERFORMANCE TESTS IN INDUSTRIAL ARTS—WOODWORK

Harry B. Nash, Director of Educational Measurements, and Roy R. Van Duzee, Supervisor of Industrial Arts, West Allis, Wis.

As long as schools have been in existence some attempt has been made to measure educational products. These measures, for reasons which we will not enter into here, were extremely inaccurate and unreliable. There is no more significant tendency in modern education than the attempt to refine these measures. The progress of this movement has been very remarkable. There is today no subject in the academic field for which there is not a measuring stick which can lay good claims to being a scientific measure. And the movement is but young. New developments are constantly appearing and educational measuring sticks are approaching the accuracy which is now to be found in present-day physical measuring devices.

Teachers in the industrial-arts subjects are slow to recognize the desirability of such objective measurements in their work. This, doubtless, is largely due to the fact that the technics developed have been "paper" measures covering information and its organization; and this, it is contended, is but a small phase of any industrial-arts subject. While it is true that such related material is receiving greater emphasis than formerly in industrial-arts work, it does not now, and probably never will, form a sufficiently large part of the industrial-arts program to make such a contention of no significance. Any valid measurement of industrial-arts subjects must measure what now constitutes from two thirds to three fourths of the course of study.

In a previous article[1] the authors described a paper test "Scale A" covering such content material as may be objectively tested on paper. It was also stated at that time that the authors felt that it was both possible and very desirable to objectively measure the pupils' skill to do the fundamental operations and were developing a technic whereby this could be done.

The present article deals with the technic which has been developed. An industrial-arts performance test in woodwork by the authors, called Scale B, is a companion test to Scale A, and contains the technic herein described.

This Scale B is based on the skills involved in woodwork as set forth in textbooks, courses of study, problem books, state bulletins, and blue prints used in junior and senior high schools. An analysis was made listing the processes and tools used in the making of shop projects. In order to select those operations which were most frequently used, the above material was worked over and a frequency tabulation was made on the analysis. For instance, as the process planing was encountered, a check was made under that item in the analysis, and so on with sawing across the grain, parallel to the grain, and so forth. As a result of this study, certain of the most frequently used processes involving tools which are common in the instruction of junior- and senior-high-school pupils in woodwork and cabinetmaking courses, were selected for the test.

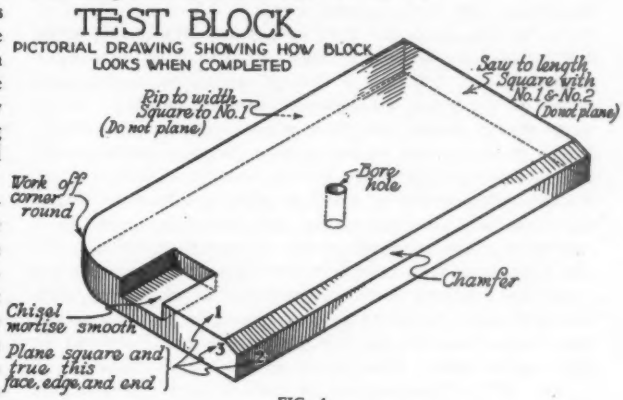

TEST BLOCK
PICTORIAL DRAWING SHOWING HOW BLOCK LOOKS WHEN COMPLETED
Saw to length & Square with No.1 & No.2 (Do not plane)
Rip to width Square to No.1 (Do not plane)
Work off corner round
Bore hole
Chamfer
Chisel mortise smooth
Plane square and true this face, edge, and end
1
2
3

FIG. 1.

The problem which confronted the authors was to devise a test problem which involved the use of the tools and the processes already selected and which did not require the expenditure of a great deal of pupil time or money; one which could be scored objectively with the tools possessed by a woodwork teacher and one which, with all this, was a test which would accurately differentiate individual pupils according to their several abilities and, therefore, could be used as a diagnostic measure. From a careful consideration of the above factors a performance test block, as illustrated in Figure 1, was devised. The test block includes the following items:

1. Reading and interpreting a working drawing; interpreting directions.
2. Processes.
   - *a*) Selecting a working face, edge, and end.
   - *b*) Planing a surface, an edge, and an end.
   - *c*) Measuring.
   - *d*) Squaring a line around a piece of stock.
   - *e*) Sawing across the grain.
   - *f*) Gauging a line around a piece of stock.
   - *g*) Sawing parallel to the grain.
   - *h*) Laying out a chamfer, a mortise, a rounded corner, and a center for a bored hole.
   - *i*) Through boring.
   - *j*) Planing a chamfer.

[1] Standard Tests in Industrial Arts—Woodwork. Page 248, July, 1927, INDUSTRIAL-ARTS MAGAZINE, Bruce Publishing Co., Milwaukee.

k) Working a rounded corner to a line.
l) Chiseling a mortise.

3. Use of tools.
a) *Individual.*
1. Bench equipped with a stop and woodworker's vise.
2. Try-square.
3. Smooth or jack plane.
4. Backsaw.
5. Rule.
6. Pencil.
7. Marking gauge.
8. ¾-in. or 1-in. chisel.
9. Bench hook.

b) *General.*
1. Dividers.
2. Sloyd or any bench knife.
3. Ripsaw.
4. Bit brace.
5. Set of auger bits, including ⅜-in. bits.
6. ¾-in. or 1-in. chisel.
7. Mallet.
8. Half-round bastard file.

The problem as designed includes the testing of the skills involved in the reading and understanding of blue prints and instructions as well as the skills involved in the use of tools in the making of woodwork problems which together constitute the greater portion of the work taught in the industrial-arts woodwork shop at the present time.

The test block was then divided up into scoring units, and scores were assigned to each unit, based on the authors' judgment, both for ease in scoring and so that a diagnostic record of the pupils' achievement could be obtained. Subsequent tryouts showed that these original values were not right. Pupils in many cases worked to more accurate measurements than the previous judgment seemed to indicate; and in a few instances they worked to a less accurate measurement. After the preliminary plan was worked out, the test was given to an unselected group of pupils under controlled conditions as to the stock used, tools provided, time allowed for the test, and as to the directions given to the pupils for doing the work. Changes in the deviations allowed and credit point given were then made, based on the difficulty of the items as shown by pupil performance. The plan in general was as follows:

1. The value assigned to perfect work in each unit ranged from 10—4. This was determined on the basis of the percentage of pupils who did perfect work. For example, where 5 per cent or less made a perfect score, a value of 10 was given; where 6 to 10 made a perfect score, a value of 9 was given, and so forth.

2. The value assigned to next to perfect work, usually $\frac{1}{64}$ in. deviation, was determined by the difference in difficulty between perfect work and $\frac{1}{64}$ in. accuracy, and also by the distribution of deviations for that particular unit of work. To illustrate, Unit No. 1 and Unit No. 10 (*a*) follow.

In Unit No. 1, no one did perfect work, while 55 per cent worked to $\frac{1}{64}$ in. accuracy. Hence, perfect work obtains 10 points and next to perfect work only 4. Again, in Unit No. 10*a*, 20 per cent did perfect work, and 20 per cent did next to perfect work. It is obvious that not only is perfect work much less difficult in Unit No. 10*a* than in Unit No. 1, but the difference in difficulty between perfect and next to perfect work is much smaller. Hence, perfect work obtains only 7 points, but next to perfect obtains 6 points. It was further found in the two units of work in question, that the range of deviation was much smaller in Unit No. 1 than in Unit No. 10*a*. In the former, $\frac{1}{64}$ in. to $\frac{3}{64}$ in. was the range, in the latter, 0 to $\frac{5}{64}$ in. was the range. The values assigned in both instances show how the fact is taken care of in the scoring scheme.

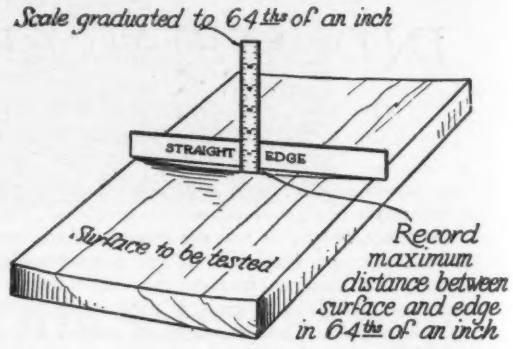

Scale graduated to 64ths of an inch
STRAIGHT EDGE
Surface to be tested
Record maximum distance between surface and edge in 64ths of an inch

FIG. 2. TESTING THE TRUENESS OF SURFACE NO. 1.

It is obvious that apart from the values attached to the perfect work, the percentage of difficulty does not receive exactly the same value in every unit of work. However, the basis is the same throughout and yields a scale of weighted credits which has been found to provide a reliable measure of the pupil's skill in the unit of work tested.

The test has a relatively high coefficient of reliability. It definitely differentiates qualities of work at the various levels of instruction determined both on a time and a nontime basis. The credits and penalties assigned to provide a time score have been statistically arrived at based on the actual distribution of time taken by the pupils used in the standardization of the test.

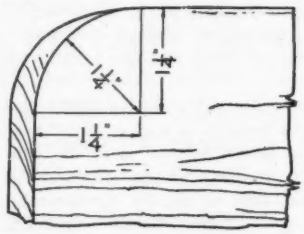


FIG. 3. ROUNDING THE CORNER.

Scale for Scoring

Unit of Work	*Procedure*	*Limits of Divergence*	*Credit Points*
1. Trueness of surface No. 1.	Place a straight edge on the length on the center line of the block and over both diagonals. Determine the maximum distance of all three measurements between the surface and the straight edge in 64ths of an inch as shown in Figure 2.	No light showing	10
		Not greater than $\frac{1}{64}$ in.	4
		Not greater than $\frac{2}{64}$ in.	2
		Not greater than $\frac{3}{64}$ in.	1
		Greater than $\frac{3}{64}$ in.	0
10. Rounded corner.			
a) *Placement.*	*a*) Measure from the end No. 3 and the sawed edge for the placement of the center. Determine the distance more or less than 1¼ in. in 64ths of an inch. The maximum divergence found from both measurements will determine the score. See Figure 3.	*a*)	
		Not greater than $\frac{1}{64}$ in.	6
		Not greater than $\frac{2}{64}$ in.	5
		Not greater than $\frac{3}{64}$ in.	4
		Not greater than $\frac{4}{64}$ in.	3
		Not greater than $\frac{5}{64}$ in.	2
		Greater than $\frac{5}{64}$ in.	0

The credits and penalties amounted to 5 points for approximately 10-minute intervals of time more or less than the time interval taken as average time. Each + 1 point actually accounts for .1 standard deviation unit above and below the average time.

The test contains three parts:

1. The working directions, telling the pupil what operations are to be performed and the order in which these should be done.

2. A pictorial drawing showing how the block should look when completed.

3. A working drawing giving all the dimensions and other necessary information.

It is so organized that the pupil has all the material in front of him while he is working on the block.

In order to secure uniform reactions to the test, the conditions relative to giving the test and the materials and tools to be used were carefully controlled. It is obvious that unless these conditions as laid down by the test are followed explicitly, variations will enter into the performance obtained which would make the product obtained of little use as a comparative measure outside of the group tested. The norms as given were obtained under conditions as set down in the test.

The scoring is simple and expeditious. No special tools are needed; such tools as a try-square, 6-in. steel scale, and combination square are used. The record sheet accompanying the test provides a complete diagnostic record of the pupils' achievement. Explicit directions illustrated by drawings are given as to how to use the scoring scheme in the measuring of the test blocks and also how to find the credit points for each quality of work. The scoring scheme is so devised that any woodwork teacher, after thoroughly familiarizing himself with the scheme, can reliably measure a pupil's performance in woodwork in about twice the time it takes to score a paper test such as Scale A. The examination takes approximately two 45-minute periods to administer.

Norms are given for performance on both a time and nontime basis. These norms are temporary. They will be revised if necessary after a more extensive use of the test. The number of cases used as a basis for these norms was not as large as in the case of the standardization of Scale A. The schools chosen were, however, representative schools. They correspond to the semester time distribution used in Scale A. The satisfactory manner in which the semester scores distributed themselves leads us to place considerable confidence in them. It must be remembered that the situation in a performance test such as this is not directly comparable to a paper test situation. The possibilities in each unit of work is small. It was found that even on the few cases used on the second tryout of material, prior to the final testing for standardization, a very satisfactory differentiation of semester levels of work was made which differed but little from the final norms. The army woodwork-performance test, which is somewhat similar to this test, was standardized on only about twenty selected cases and on this basis a scale was determined which differentiated candidates into four distinct groups.

Tables are furnished which furnish the norms to be used as a basis for interpreting the scores obtained. Percentile norms are given and also a corresponding school mark which is equivalent to the various levels of work.

Owing to the varied amounts of time devoted to woodwork in the same grade in different schools, norms on a grade basis would be meaningless. These are, therefore, given based on the time devoted to woodwork, which to the authors seems the only satisfactory basis on which to make comparisons. The basis is the same as in Scale A, thus making the norms on both scales directly comparable. This increases the value of both scales.

It is of no purpose to measure an educational product unless practical utilization is made of the results obtained. A brief summarization of the uses of the test are here given.

1. The test furnishes a measure for objectively determining the skill and speed with which a pupil at various semester levels can do fundamental woodwork operations with common tools. Such an objective measure enables a supervisor or teacher to compare the achievement of his school or class with representative schools elsewhere. It also provides a means for comparing various classes doing the same semester's work or with classes doing different semester's work. It will give a needed answer to such questions as "Have the different time exposures in woodwork produced an adequate and progressive increase in skill?"

2. The test provides a means when used with the companion test Scale A of comparing the relative achievement of the pupils in shopwork performance and in related and technical information. In one instance the authors used the same school in standardizing both Scale A and Scale B. It was found that on Scale A this school scored low, while on Scale B it scored high. This school is actually devoting more than average time in shopwork and this is clearly indicated in the test results. By taking representative schools the norms represent an average situation as to the relative time devoted to shopwork and related information.

3. The test furnishes a means for measuring the yearly progress of pupils as they pass from semester to semester.

4. The test provides a means to measure the efficiency of instructors and various teaching methods.

5. The test can lay good claim to being a real diagnostic measure. It is so organized that a study of the record sheet reveals at once the relative achievement of the boys in the different units of work. This use of tests is being widely stressed at this time and the authors distinctly had this in mind when constructing Scale B.

6. Any test which is diagnostic can also be used more satisfactorily as an inventory test than one not so organized. The test, then, is a valuable inventory test and gives a vivid picture of the class' ability. Inventory tests are always desirable; they are especially desirable in all industrial-arts subjects where time and grade offerings are so widely different from school to school. It is also possible for a teacher in a comparatively short time to determine the achievement of new boys entering his school. Efficiency of teaching and economizing of pupil's time make inventory tests a necessity.

7. As a partial basis for assigning school marks and as a help and check in teacher judgment. How reliable are teacher judgments of shopwork performance? The authors have information which suggest that such judgments are not as reliable as might be expected in a subject such as woodwork where perfectly objective measuring tools are available.

8. Objective tests have promoted educational research in the academic field.

Educational procedures are no longer based on mere opinion but on objective evidence. Such research is very desirable in the field of industrial arts and reliable objective measures will do much to promote it. It will enable workers to objectively answer many questions which previously have been matters of opinion. It will help furnish answers to such questions as the following:

"What is the correlation between skill and information?" The authors found a correlation of .57 between Scale A and Scale B. This would indicate a higher relationship between performance and information than is usually thought by many to be the case.

"What are the relative merits of various methods of instruction?"

"How much time is necessary to secure desired results in both related information and skill in performance?"

"How large a class can be taught in woodwork and secure desirable results?"

"What is the correlation between prognostic measures of mechanical aptitude or ability, and objective measures in skill achieved in industrial-arts subjects?"

RELATING INDUSTRIAL HISTORY AND THE INDUSTRIAL ARTS

Mary Harden, State Normal School, New Haven, Connecticut

THROUGH the solving of the problems suggested in this study, it is hoped that the pupils of the junior high school will be better equipped to appreciate the many relationships existing between them and the world in which they live. Teachers often become so absorbed in subject matter that they frequently neglect to relate their teaching to life situations. When school subjects are presented merely as school subjects, no attempt is made to develop within the pupils an intelligent and an appreciative attitude for the everyday things about them.

No subject in the school curriculum presents more opportunities for acquainting the child with the world in which he lives than does the subject of history. But history in the abstract will not help children to understand themselves. The teacher of history who endeavors to trace the development of human events as they actually occurred, and who uses the activities of the community as an approach to the activities of the outer world is, by means of such teaching, helping children to establish definite relationships between the things learned in *school* and the things seen *outside* of school. Through such presentation of subject matter the most common surroundings become significant to the learner.

Although the study of history presents numerous opportunities for interpreting everyday events, it is by no means the only school subject which offers such advantages. It is quite probable that if a selection of subjects was to be made on the basis of the objective just discussed, history would not be included. If such a study were made it would not be at all surprising if the subject selected for the realization of such an objective would be industrial arts. For a long time this subject, because of its appeal to the native impulses of the children and the visible results in teaching, has been regarded as a subject possessing great educational value. But often the visible results have been visible results and nothing more.

History and the industrial arts contain much related material which can be used to help make the child's world intelligible. The element of progress is common to both subjects. The history teacher wishes the child to view the world as a developing world. The teacher of industrial arts also wishes him to see the world as a developing world, confining that development more closely to industrial and economic changes. Through such a study the teacher expects to develop within the mind of the child an industrial intelligence, and to create a more sensitive and sympathetic attitude toward his economic surroundings.

In order to realize such objectives it is necessary for children to become acquainted with the thoughts, feelings, and actions of people living *now* and the thoughts, feelings, and actions of people who lived in the past. No true understanding of progress can be gained through a study of the present. In order to know and to understand the present, one must go to the past. For a true appreciation of progress in industry the very beginning of industry must be studied. In tracing this development through the ages of man, change and progress become evident.

The objectives involved in the types of problems suggested in this study can best be realized in the junior high school; for psychologists agree that children of this age are interested in anything that shows development. In the elementary school they have been taught the processes of industry so that in the junior high school they are ready to study the history of the development of these processes. Children of this age are indifferent to ready-made generalizations. But they are in a receptive mood for details which will aid them in drawing conclusions. Therefore, in selecting material to develop such problems as listed in this study, one must present the data in concrete form. All of the suggestive problems have been formulated with the definite idea of having them serve as "leads" to other worth-while activities. Therefore, the real test of the value of these problems depends upon the amount of interest which they stimulate for future worth-while activities.

To many, the omission of problems in construction may seem unusual. From the study of industrial arts in the elementary school, most pupils are familiar with the different types of constructive work which could be related to industrial history. If the teacher feels the need of such work for clarifying teaching situations, it should be introduced.

Problems

One of the fundamental principles emphasized in formulating these problems for classroom practice was the principle of providing concrete materials. In a brief search one may discover such an abundance of material that the question is not *where to get the material*, but *how to utilize so many details*. If children are to understand how the present came from the past, the past must be made real to them. Dramatization is an exceedingly effective method to employ when one wishes to secure this feeling of reality. Such an exercise should be based upon historical facts rather than upon imaginative details.

Problem 1

The study of any local industry will reveal many interesting facts which can be used for dramatization purposes. The following suggestions illustrate how such material may be used.

A. *Dramatization—The Making of a Shoe.*

The exercise may open with a prologue. The prologue should contain many historical facts.

1. Select an attractive title for the sketch; e.g., *How Boots and Shoes Were Made in Colonial Days.*

2. From the following statements select the facts which will help to make the prologue interesting:

The shoe industry appears to have begun in Salem, Massachusetts, where Thomas Beard and Isaac Rickerman settled in 1629. They came on the Mayflower on her second voyage to America. They were shoemakers by trade, and are the earliest shoemakers of record in this country. Shoemaking retained for one hundred years after its establishment in new lands the methods which had been in use for centuries in Europe. The shoemaker sat on his bench or seat, cut with a knife the upper sole leather from the hide, stitched the upper with an awl and a waxed end, hammered the sole on a lapstone, and sewed it on by hand, turning out a complete shoe with few tools other than hammer, awl, and knife, and a wooden stick with which the edges of the soles were finished.

3. What facts contained in the above selection could be used in helping to plan the setting?

4. Make a collection of pictures which will assist in securing a suitable setting. ("The Cobbler's Shop of Old Days," Hughes, *Economic Civics*, p. 113.)

B. *Exhibits.*

1. Make a collection of pictures of shoes worn in past times.

2. Make a collection of pictures of old-time shoes which will show the changes in style during the development of the industry. (See Wright, Thomas—*The Romance of the Shoe*, and Towle, Herbert C.—*The Shoe in Romance and History*, for suggestions.)

3. When the collection of picture of old shoes is well under way, someone will probably begin making a collection of present-day types of shoes. Advertisements in the daily newspapers show styles in shoes.

The following questions may be asked:

a) How does the large variety of styles in shoes affect the consumer? The producer?

b) Explain the following statement:

"In the year 1870 the German army marched over one mile per hour faster than the French army because they were better shod." This statement and the following verse can be used to bring about a discussion of what kind of shoes one should wear.

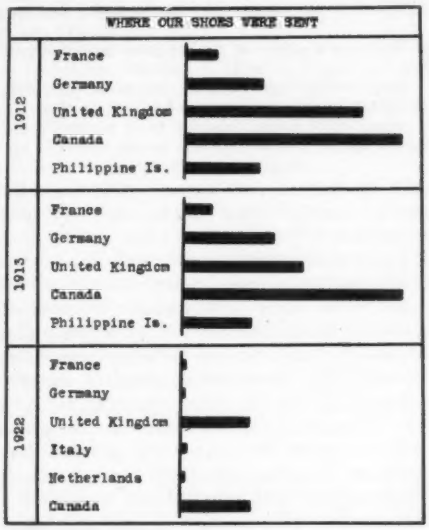
"Let firm well hammer'd soles protect thy feet
Through freezing snows and rains, and soaking sleet;
Should the big last extend too wide,
Each stone will wrench the unwary step aside;
The sudden turn may stretch the swelling vein,
The crackling joint unhinge, or ankle sprain;
And when too short the modish shoes are worn,
You'll judge the seasons by your shooting corn."

C. *Investigation.*

As soon as the discussion of the industry centers on everyday conditions, the pupils will probably give the teacher many interesting "leads" for the formulation of new problems.

Where do we send our shoes?

From such a problem as this, one is lead directly out of the field of dramatization into the field of investigation. In solving the problem just raised, comparative graphs will be of great assistance, for they make generalizations interesting.



Suggestive questions for the study of comparative graphs:

1. Who buys shoes from us?
2. Do we buy shoes from other countries. Why?
3. Why has our market changed since 1912?
4. How long have we sold shoes to Europe?

The teacher may read the following newspaper clipping to the class:

One Hundred Years Ago

"Shoes, Boots, Linseys, Kerseys, Etc.

Bancroft & Pope, 149 Pearl Street, up stairs, have on hand, and for sale on accommodating terms, a large and extensive assortment of shoes and boots of all descriptions, calculated for exportation, and for the southern and western markets.

Also—25 bales of stout twilled linseys
4 do. do. drab kerseys
5 cases blue mixt sattinets
4 do. 3-4 indigo-blue checks."

5. What do some of these countries send to us in return for our Shoes?
6. Where do we get the material with which to make our shoes?

D. *Recreational Reading.*

The following selections might be used in connection with the study of shoes.

Whittier. *The Shoemakers*

Larcom. *Hannah at the Window Binding Shoes*

Dickens. *A Tale of Two Cities* (Dr. Manette, a distinguished maker of shoes).

Problem 2

In a study of the industries one should not miss an opportunity to show children how dependent we are upon one another. The following map exercises will help to show that there is a problem of interdependence in industry.

1. Make a list of the principle industries in your city.
2. Locate these industries on a city map. (Make your map give as much information about the industry as you possibly can. Very often pictures help to do this. Maps which you illustrate with your own drawings are very interesting.)
3. What relation do these industries bear to your state? Put your conclusions upon a map of the state.
4. What relation is there between the industries of your state and the section of the country in which you live? e.g., Illinois—Middle West. Show this relationship on a map.
5. Can this relationship be extended into other sections of the United States? The World? Make your maps do the talking for you.
6. How does your city show its dependence on other cities? How do other sections of the world show that they depend on you?

Problem 3.

In studying local industries some definite plan should be worked out for visiting factories. Trips which are not organized are of little value. In order to make pupils realize that the element of change is a great factor in progress, it is necessary to acquaint them with factories of the past.

The following excerpts are suggestive of what pupils may look for in their study of early industries.

"The first cotton factory of Paterson, New Jersey, was ninety feet by forty feet and four stories high. It was completed in 1794. Cotton yarn was spun in the mill. Calico shawls and other cotton goods were also printed.

"In 1798 Samuel Slater entered into a copartnership with Oziel Wilkinson, whose daughter he had married, . . . under the firm name of Samuel Slater and Company. Mr. Slater superintended two mills and received $1.50 per day from each mill.

"In 1814 a large wooden manufactory one hundred and twenty feet by forty feet, and five stories high, was built at Lexington, Kentucky. It employed one hundred and fifty persons, of whom many were children.[1]

"The children were incapable of performing their day's labors well towards the close of the day; their fate was to be awoke by being beaten, and to be kept awake by the same method. The children and young people were sometimes successful in their attempt to escape from labor and confinement. I have gone after them on horseback, and brought them back myself. Those brought back were taken into the mill and got a severe beating with a strap, sometimes a master kicked them on the floor and struck them with both hands and his feet.[2]

Chart for Tabulating Visiting Observations

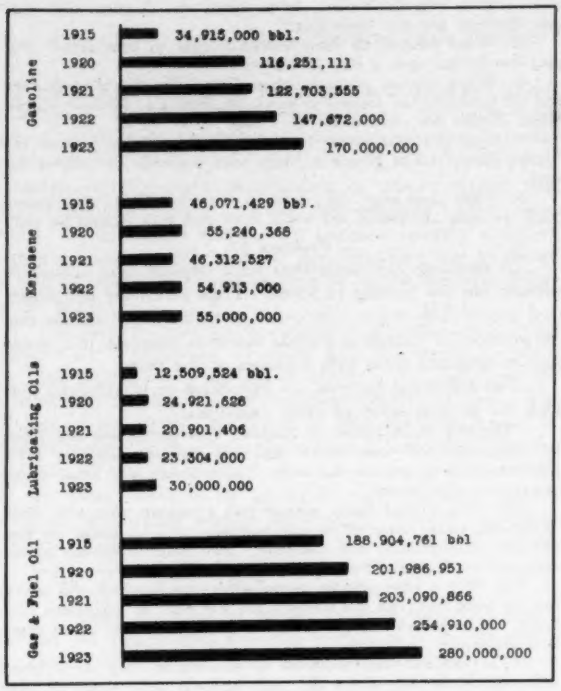
1. Origin:
   - *a*) Founders
   - *b*) Time
   - *c*) Purpose
   - *d*) Factors favoring development
2. Relative Location:
   - *a*) To transportation routes
   - *b*) To other industries
   - *c*) To raw materials
3. Workers:
   - *a*) Health
   - *b*) Age
   - *c*) Wages
   - *d*) Hours
4. Machinery:
   - *a*) Kind
   - *b*) Skill required for operation
   - *c*) Safety appliances
5. Market:
   - *a*) Local
   - *b*) Domestic
   - *c*) Foreign
6. Recreation:
   - *a*) Kinds
   - *b*) Equipment
   - *c*) Time
7. Provisions for Education:
   - *a*) Kinds
   - *b*) Equipment
8. Remarks:

Problem 4

In studying the industries, every available means of comparing their growth should be used. The following illustration is suggestive of the kind of material to use in illustrating this

[1]Bishop, A History of American Manufacturers, Vol. II.
[2]Osgood, Ellen L., The History of Industry, p. 269.

growth. Given the correct data, the children will conceive of interesting ways to convey the idea to other people. Perhaps there is a school paper where they can publish articles and illustrations.



From the following figures, make a graph which will show the amount and value of worsted and woolen cloth exported from the United States. After a careful study of the graph, make a list of questions which you would like to ask about this study.

Yards of Goods Exported from the United States in 1922
Problem 6. Clippings
Worsted Cloth

Country	*Yards*	*Value*
France	.....	.....
Germany	.....	.....
Italy	10	$ 25
Netherlands	.....	.....
Spain	.....	.....
England	.....	.....
Switzerland	.....	.....
Quebec and Ontario	49,440	68,476
Cuba	7,933	13,397
Philippine Islands	3,843	3,697

Woolen Cloth

Country	*Yards*	*Value*
France	1,611	$ 2,823
Germany	5,520	2,100
Italy	163	531
Netherlands	30	53
Spain	.....	.....
Switzerland	1,181	682
England	11,011	17,013
Quebec and Ontario	44,361	542,895
Cuba	102,625	36,446
Philippine Islands	39,022	36,446

For the next exercise, follow the same directions as given above.

Where Do We Buy Our Handkerchiefs?

Country	*Dozen*	*Value*
Austria	879	$ 2,683
Azores and Madeira Islands	20,598	46,829
Belgium	475	2,137
Czechoslovakia	1,302	6,024
France	57,584	191,226
Germany	6,526	10,527
Spain	7,793	18,075
Switzerland	30,331	53,549
England	93,828	169,430
Ireland	936,700	1,668,060
Japan	1,205	1,532

Problem 5
Biographical Study

A study that teaches so much about *what man has done* will probably stimulate a certain amount of interest and curiosity in *how man happened to do these things.* Every effort should be made to provide suitable material for answering such questions.[8]

The following questions will aid pupils in preparing reports for class discussion.

1. Where did the inventor live?
2. What kind of home did he come from?*
3. What educational advantages did he enjoy?*
4. What were some of his personal characteristics?*
5. How did he make his living?*
6. Was he successful in his work?*
7. Would you like to have him for a neighbor?*
8. Did he have many friends?*
9. Who were his enemies?*
10. What aroused his ambition to be an inventor?
11. Was he aware of the fact that he really had accomplished much?
12. What were some of his personal grievances and controversies?*
13. How much did he influence present-day industries? What did he contribute to the advancement of human welfare?
14. How did his family help him to be successful?
15. Did any of his children carry on his work?

Problem 6. Clippings

Daily newspapers and current magazines furnish an abundance of material which can be used very effectively in studying industries.

Clippings taken from the wholesale sheet of the New York Times and from trade journals contain material which can be used in the study of industries. When children once cultivate the clipping habit there is no stopping place. The problem for the teacher is how to utilize this material in a profitable way. The first interest is usually aroused through current events. Lively discussions centering around economic conditions will often occupy more than one class period. After a few such discussions the teacher will probably discover that the interests are becoming exceedingly personal. Such interests should be encouraged and pupils should be allowed to engage in activities which will help them to pass their interest on to the other members of the group. It will not be long before the class becomes very much interested in the problems of the entire group.

Suggestive questions for the study of clippings:

1. What are the leading colors for the season?
2. Do you think these colors practical? Why?
3. How does the introduction of many colors for hats and dresses influence manufacturing? Prices?
4. Who determines the price of wearing apparel?
5. What determines the choice of color when you purchase clothing?
6. How can manufacturers make prices high?
7. When is the best time to buy winter clothing? Summer clothing?
8. How do the clippings help you to answer these questions?
9. Select a number of fashion clippings which illustrate good design in dress.
10. Make a fashion poster which illustrates good design and appropriate color in costume.
11. Perhaps you could make some paper dresses and hold a fashion show.
12. Collect samples of materials to be used in this season's garments. What determines your choice of material when buying a garment?
13. How may the consumer help to regulate prices?

Problem 7

Industry has a significance entirely lost to those who know nothing of its processes and detailed achievements. A lifelong interest may be developed in the activities of industry so that one will find satisfaction and pleasure throughout the years

*Johnson, Henry, Teaching of History, p. 174
[8]Bachman, Frank P., Great Inventors and their Inventions.

in noting the discoveries, inventions, and new uses and applications of science in industrial production. Such an interest as will lead one to read with satisfaction from week to week or month to month the current reviews of science, invention, and industrial progress in a popular or semipopular magazine is worth while. . . . To develop an intelligent, permanent interest in the changes and progress of industry is believed to be a very worthy purpose in the study of industrial arts.[4]

Here again the interest may be stimulated by cultivating the clipping habit. Pictures showing the latest discoveries and inventions are sure to make an appeal. Pictures taken from Popular Mechanics, Popular Science Monthly, and The Literary Digest, contain much valuable material for this type of exercise.

a) Study guide for clippings.

1. How do these inventions compare in utility with the inventions of a hundred years ago? Fifty years ago?
2. From a study of pictures, write a short article which will tell something about the history of the people in January, 1928.
3. Look up the important dates and names in the history of some recent inventions and find out the steps in its development.
4. Prepare an oral report on some modern invention in which you are interested. Perhaps you are working on an invention which may be of help to others.
5. Construct a time chart of the inventions which have influenced present-day civilization. Make the chart of brown or white paper using a contrasting color for marking your time. If you make a chart two or three feet wide you can place pictures of the inventions on the chart. This will be of interest to people who are not studying the story of the inventions. (See Madeley, Helen, History as a School of Citizenship, p. 38.)

b) Vitalizing the Place of the Inventor in History.

In most history classes pupils are encouraged to remember the names, birthdays, and certain achievements of great statesmen. Seldom is their attention directed toward the achievements of the men and women who have made possible the comforts which they enjoy today.

Who has done more for women than Elias Howe?

Many teachers keep birthday calendars of statesmen. The same idea may be used for inventors. Pupils can design attractive posters which illustrate some of the important facts of the inventor's life. A small birthday card of varying dimensions can be designed so that it will contain the important dates of the inventor's life and some slogan which is illustrative of what he has accomplished.

[4]Bonser and Mossman, Industrial Arts for Elementary Schools, p. 13.

Problem 8

In presenting history to children, the teacher should endeavor to acquaint them with conditions as they actually existed in the period which is being studied. Here an effort should be made to secure a feeling of reality for the events of the past.

Read the following reference:

(Osgood, Ellen, History of Industry, pp. 267-270.) Imagine yourself a working child of a hundred years ago. Keep a dairy which explains the working conditions of children during the industrial revolution.

Problem 9

Very often in the study of industries, children become interested in knowing how certain industries happened to be located in certain localities. The art of letter writing can be revived here. Letters may be written to leading manufacturing centers asking for such information. Chambers of commerce are usually willing to answer all such inquiries; e.g., Samuel Slater and the Beginnings of the Factory System, Pawtucket, Rhode Island.

Problem 10

In the junior high school many pupils will be interested in making booklets. The field of industrial history is rich in material for this particular activity. Pupils who are interested in certain inventions will be stimulated to collect material which will increase their knowledge of inventors and inventions. They may, through such a study, desire to create an original design for a booklet.

In this study no attempt has been made to exhaust the possibilities of problem solving as related to industrial arts and industrial history. If by solving these suggestive problems, children develop an appreciation of the world in which they live, much has been accomplished.

THE MASTER MECHANIC DISCUSSES APPRENTICE TRAINING

C. J. Freund, Apprentice Supervisor, The Falk Corporation, Milwaukee, Wis.

THE MASTER MECHANIC came out of his glass-inclosed office on the day before Thanksgiving and hailed the apprentice supervisor who was passing at the moment. "What is all the hurry about? Are you trying to avoid me?"

The supervisor halted with a slightly puzzled expression on his face.

"You must not look so worried," the master mechanic told him; "I am not going to give you any advice or instruction this time. You have often spoken to me of the vocational school and the splendid work which is being done there. I know that you want me to visit the school. Couldn't we go together day after tomorrow?"

"We surely can," was the reply; "at what time shall we go? Where shall we meet? How long shall we stay? I am glad you have time to see the institution."

"I suggest that we meet at the east entrance of the school at nine o'clock in the morning."

Accordingly, the master mechanic and the apprentice supervisor arranged to devote the ordinarily uninteresting day after Thanksgiving to an inspection of one of the outstanding vocational schools of the world.

The master mechanic is in charge of all the machinery and equipment in a large plant devoted to the making of heavy, special machinery. Electricians, maintenance men, steamfitters, boilermakers, all report to him. He is responsible that furnaces, pumps, engines, lathes, saws, cranes, elevators, function efficiently. Moreover, he has great inventive and constructive ability and has designed and directed the building of a considerable number of remarkable special-purpose machines.

He is most emphatically not an office man. Here, there and everywhere in the plant his gray moustache, his spectacles, his derby hat and his blue shirt (without cravat) may be seen. Occasionally he goes into his office to discuss a problem with a draftsman or into someone else's office to plan a projected piece of work but in a few moments he is again back among his beloved machines and tools. He learned his trade in Germany, thoroughly, and has had many years of experience, including the superintendency of an important machinery-building plant and the management of a manufacturing business of his own. Nor are his interests restricted to mechanical things. He reads much in history, political economy, and science, and is somewhat of a philosopher.

His attitude toward the training of apprentices is very favorable. Although he feels that some of the modern training features have been overdone, he believes that the training of young men in trade work will be successful if certain fundamentals are observed and seizes every opportunity to keep these fundamentals in the mind of the apprentice supervisor.

So much for the character and personality of this interesting and kindly gentleman.

A Visit to the Milwaukee Vocational School

On Friday morning, therefore, the master mechanic and the apprentice supervisor sat on a bench in the main office of the vocational school, waiting for the director of the school who was to conduct them through the establishment and explain its work. For a time the master mechanic was silent as he observed the many young students who came into the office on errands and appreciated the tact with which the various problems of lost locker keyes, absence on the last school day, and unemployment were considered. Then he turned to the supervisor.

"The vocational school is an exceedingly important factor in the success of an apprentice-training program, and those plants which are located in cities where no schools of the kind have been established are at a serious disadvantage. The school, of course, gives the boys the necessary related instruction; in the school they learn the necessary mathematics, the principles of mechanics, of mechanism and of metallurgy, and some of the essential matters which have to do with citizenship and the organization of industry.

"However, in my opinion, this related instruction is not the primary function of the vocational school in apprentice training. There are other things of greater importance. They have to do with the development in the young man of good character and habits. The apprentice in the shop is subjected to so many influences which are by no means favorable. These influences must be more than balanced by the good influence of the instructors in the school and the impression left upon the apprentices by the order and spirit of the classes.

Teaching the Value of Ideals

"For instance, the average mechanic is careless and thoughtless and does not take his work too seriously. He is satisfied to make three pinions on a lathe per day if he is not pressed to make more, even though he knows he could easily make four or even five. His mind is only too sure to be out with his automobile or with his friends on the bowling alleys or elsewhere while his hands are at work. There are many exceptions but the majority of our people belong to this class and they will discourage the apprentice who brings to his work all of his energy and ability.

"Again, the foremen and superintendents cannot alone counteract this great influence. They are too busy getting out their work. A foreman may come to the conclusion that the apprentice on the third boring mill down from his office is becoming careless in his work, but just at the time he plans to talk to him about it a superior is certain to come to him with a rush order for a heavy shaft collar which must be shipped that same afternoon. Also, the foremen have their hands full in teaching the boys the use of tools and the operation of machines and have no time left for what may be called the fundamentals of apprenticeship.

"Therefore, the apprentice must come under the influence of men who are not careless and who are not thoughtless, men who understand the value of time, the idealism of work and workmanship and the advantages of good character and who have themselves the time to impart all this to the apprentices and are in a position to do so. This is the work of the vocational-school teacher and constitutes the most valuable contribution of the vocational school to apprenticeship."

The discussion was cut short by the entrance of the director who motioned the two men to come into his office.

Inculcating Habits of Cleanliness and Orderliness

Some weeks later the master mechanic came into the apprentice office and his manner and facial expression made the apprentice supervisor remark in his own mind, "Well, I wonder what in the world is the matter now." He said nothing, however, but waited for the master mechanic to begin. He began immediately.

"Last Monday you sent a new boy to begin work in my department."

"Yes," the supervisor assented in that questioning tone which conveyed the additional question, "What about him?"

"He is impossible; he is dirty, slovenly and disorderly."

In the mind of the supervisor arose a picture of the master mechanic's own department where the floor is always swept clean, where the slightest accumulation of rubbish is sternly prohibited, where machinery sparkles and glistens, and where every piece of equipment not in use is properly marked and lies in the proper place on the proper shelf. He fully appreciated how such a place would emphasize the boy's bad habits. In fact, he would not have sent the boy to that department had he known of his deficiencies.

"You should see the place when he has finished work," the master mechanic continued; "hammers, scales and wrenches are left all over the floor and the machine or bench; into the corner are thrown oily waste and scraps of paper; there are more apple cores and bread crusts in his tool box than there are tools. I am afraid that this lad will teach my men more bad habits in a week than I can cure them of in six months. Besides that, I am certain that his mental processes are as slovenly as his work."

The energy of the outburst had spent itself and the master mechanic began to generalize.

"Cleanliness and order are two of the fundamentals in apprentice training. A disorderly mechanic is never a good mechanic. We must show our boys why cleanliness and order are so important. They must be made to understand that when tools and equipment are carefully arranged, it is much easier to find what they are looking for. Also, the planer or milling machine which is kept clean and in good condition is much easier to work with and makes the operator capable of better work. Besides that, the mechanic who constantly works in orderly surroundings acquires methodical ways of thinking which add very much to his ability."

"Is the boy a hopeless case? Should we pay him off?" the supervisor asked.

"No, I think not. Something can be made of him. He has some excellent qualities. I think I shall keep him and see what I can do with him. My men will set him a good example and a good example will accomplish more than much talk. And, of course, he cannot really spoil my men, they are too old for that.

"Would it not be a good plan to bring his problem to the attention of the authorities at the vocational school? The instructors can bring all their energy to bear on his failings and they should get results."

The Apprentice Must be Interested in His Work

One day the master mechanic was walking through the yard on his way from the main office to the foundry and discovered an apprentice and the apprentice supervisor talking intently though quietly near the door to the time office. The apprentice wore good street clothes and obviously had not done any work that day. He was a big lad and had an appearance of being capable. His manner suggested self-confidence and determination although his intelligent features expressed worry and disappointment.

This apprentice had been in the shop only a short time but his obvious superiority had attracted the attention of the master mechanic who now wondered what difficulty the boy had got into. During the noon hour he sought out the apprentice supervisor and asked about him.

"Oh, the boy wants to quit; he is dissatisfied and says that machine-shop work is not what he had expected. He showed promise when he came here several months ago but his attitude has constantly grown more listless and I was not at

all surprised when he came in this morning all dressed up and said that he was through."

"What is his difficulty?" the master mechanic inquired. "Precisely what worries him?"

"I don't know and he doesn't know himself. He is generally discouraged. I have induced him to try it for two more weeks but I have little hope that he will remain after that time."

The master mechanic said no more but later in the day he telephoned to the apprentice supervisor regarding the matter to which he had plainly devoted much thought. "Send that boy into my department. I believe that I know what ails him and I want to make some experiments that may do him some good."

Two weeks later the young man came into the apprentice office. He was smiling, happy and enthusiastic and announced his intention of remaining an apprentice. The supervisor was amazed and at the first opportunity learned from the master mechanic how the transformation had been accomplished.

"You can't expect a young man, especially a young man of his caliber, to turn out hundreds of gears on a lathe without knowing where those gears will be used, what machines they will become a part of, for whom they are being built. You cannot make a machine of the boy. The apprentices are intelligent, they must be given something to think about, their work must be made interesting. They must be told not only how to do their work but why they are doing it. Our boys of today have a legitimate curiosity regarding even such things as customers, competitors, the financial structure of the organization, and other matters which the shopman of a dozen years ago was supposed to know nothing about. Only interesting apprentice courses will be successful."

Teaching the Apprentice to Shoulder Responsibility

The huge, tractorlike sand mixer of the foundry department was out of commission. Its great frame, running gear and rotor stood in the repair department, but its power plant, a six-cylinder gas engine, had been lifted out and dismantled and a number of mechanics were at work on the parts which lay scattered about the floor and bench. The master mechanic, with rueful countenance, was examining a crankshaft bearing which had been damaged by lack of lubrication. The apprentice supervisor came along to talk to the foreman of the repair department and the master mechanic called him and showed him the ruined bearings.

"See here what has happened because someone neglected to replenish the oil for this motor. Tonight more than a hundred tons of foundry sand will have to be mixed by hand shoveling. It will take more than a dozen men many hours to do what this big machine would have done in less than an hour if one man had paid attention to his business.

"Our mechanics do not understand the responsibility which they assume when they are given charge of a machine or other equipment. Our young men, our mechanics of the future, are now in your care. Teach them responsibility for machinery or see to it that they are taught. I know that they are told over and over to clean their machines and to oil them but that is not sufficient, that does not impress them with the extent of their responsibility. It is good to tell them the cost or approximate cost of some of our machines. If any one of the boys were given a piece of jewelry worth $500 or $600, or that much in cash, and were told to deliver it to a downtown jeweler or bank, they would take the assignment very seriously. Still, how many of our machines could be purchased for $500? If our boys knew that many of the machines are worth several thousand dollars, that a number of them are more expensive than a large locomotive, and that the smallest tool holder may be worth $25 or $30, they would not need to be told about oiling and cleaning and keeping tools off polished surfaces; all those things would take care of themselves, and recurrences of incidents like this would become less and less frequent."

Emphasizing the Knowledge of Fundamental Operations

It was raining heavily one evening and the master mechanic invited the apprentice supervisor to ride with him in his car.

"It is a great satisfaction to go home at the end of a day in which you feel that you have accomplished a little something," remarked the master mechanic as he gently coaxed his motor, which was protesting the heavy climb out of the valley after a long day of rest.

"Yes, indeed, especially if you like your work," agreed the supervisor.

"Well, I certainly enjoy my work. I am naturally interested in all departments of the shop because my work takes me into all of them, but I must admit that the work of the machinist and the fitter appeals to me the most. Those were the trades I first learned and in building our new machines, which fascinate me greatly, these trades are the most important.

"Did you ever realize that the hammer, the chisel and the file are of great importance in the machinist trade? A man who understands the use of these tools is already half a machinist. Cutting metals is the machinist's task. If he knows how various metals react to the cutting edge of a tool he knows the rudiments of his trade. And how can he better learn these reactions than by personally manipulating the cutting tool? The apprentice who has driven a cold chisel through cast iron and a half dozen different kinds of steel and nonferrous alloys knows about cutting angles and clearances instinctively; he does not have to learn it tediously (or fail to learn it) from diagrams in books and on blackboards.

"Such an apprentice quickly learns also the proper grinding of tools which is an important part of his trade. In fact, the man who can grind and set up every kind of tool and can secure every kind of job surely ranks as a machinist of the first order. I sometimes wonder if the teachers in our trade and vocational schools sufficiently emphasize the importance of these fundamentals; if they are not tempted to cater to the natural curiosity of the boys and permit them to begin the actual operation of machines before they are ready for it."

Will Automatic Machinery Replace All-Around Mechanics?

A copy of the Midwestern Engineer had been sent to the apprentice office from the upper regions in which an article by a well-known engineer and manufacturer was marked. The article was entitled "The Mechanization of Modern Industry," and told how machines were rapidly replacing men as production methods were more and more highly developed. The author pointed out that the tendency is to assign to each machine but one operation, or a simultaneous series of operations on a single part and to substitute machine operations for hand operations wherever it is possible.

The conclusion was drawn that these new processes were gradually doing away with the need for skilled mechanics; that a man could be taught the operation of a milling machine in a week or two if the only operation performed on that milling machine was the milling out of a fork on a standard bracket of which several hundred had to be made every day. In view of these conditions, the writer of the article suggested the thought that the attention devoted to the training of young men for industry was considerably overdrawn.

The supervisor read the article, reread some passages of it, and meditatively looked out of the window. Soon he came back to his desk and wrote "Read this and tell me what you think of it" on a piece of notepaper and pinned it to the article. On his next round the messenger boy brought article and note to the office of the master mechanic.

"There can be no doubt," the master mechanic remarked the next day, "that his description of the prevailing tendency in manufacturing is correct enough, but it appears to me that his conclusions are superficially drawn. In the first place, there are great industries which can never be put on a production basis. Locomotives, engines for ocean vessels, boilers and machinery for electric power stations are only a few ex-

amples of products which cannot be turned out by the thousands on specialized machines. In these industries the expert and all-around mechanic is indispensable.

"Moreover, even the production industries are dependent upon the skilled mechanic. When a production machine suddenly goes wrong who is it that must discover the trouble and correct it? Who sets up the tools on machines of that kind? Who plans the operations for the many machines and the combination of machines into different departments? Who is it that makes the jigs and special fixtures for all these special machines? How about foremen, inspectors, set-up men, superintendents? Who attends to the maintenance of all the machinery and equipment? No, the day of the skilled mechanic has not yet passed, not even in the production industries.

"But that is not all. I am becoming more and more convinced, although I cannot supply satisfactory proof, that these staff and supervisory positions in production manufacturing are creating opportunities for the trained mechanic which could never have been imagined but a few years ago.

"I am curious to see if this article will not be challenged in the next issue or in future issues of the Midwestern Engineer."

Apprenticeship Wages Include More Than Money

"Where were you yesterday afternoon?" the master mechanic asked the apprentice supervisor as he stopped in his office one noon on his way from the dining room; "I was looking for you and they told me you would not be here."

"I attended a committee meeting of our association for determining rates of pay for apprentices in the different plants of the district. You know, we are trying to standardize our apprentice courses. As far as schedules of work and operations are concerned, this has been pretty well accomplished. We are confronted now with the task of making pay rates uniform in all the shops. It will be a big task. Yesterday we held our first meeting and there will be many more before the whole matter is settled."

The master mechanic sat for some time in silence.

"Oh, I suppose it has to be done," he then said. "Isn't it too bad, though, that you should spend so much valuable time on something which is of secondary importance in apprenticeship? The first aim of a young man in taking an apprentice course should, of course, be training. The learning of the trade comes first, then comes the earning. I should be suspicious of a boy who applied for employment as an apprentice and whose first question were about the pay he was to receive. He should satisfy himself regarding the value of the training to be given, the facilities in the plant for providing such training, the extent to which the supervision of apprentices has been developed and other information which he may need in order to feel reassured that the organization is capable of laying in him a foundation upon which he may build a lifelong of successful work in his chosen occupation with an income which will make a matter of a few cents per hour during his apprentice course of little importance. Only thus can apprenticeship be kept on a high level. Apprenticeship must never become mercenary.

"The apprentice should have the same attitude toward his apprenticeship that he had toward the years spent in school. Both the school and the apprentice training are an investment. In the case of apprenticeship the investment can be measured; it is the difference between the apprentice pay rate and the rate which the young man might earn at regular employment.

"The apprentice rate, however, entitles the apprentice to special training and consideration in his work. Where the apprentice is involved, production requirements must give way to training requirements. When the apprentice in the foundry has completed his time on small cores he must be moved to large coremaking, or whatever else is next in order, even though the work in the small-core room may be slightly and temporarily hindered. Any other procedure is mere exploitation and no better than the old-fashioned practice of forcing apprentices to spend their entire training period in sweeping floors, running errands, and other forms of common labor."

The Vital Commonplaces

One bright, warm day early in April the master mechanic came into the apprentice office to say good-by. It was the first day of a long vacation which he was to spend in Europe visiting his boyhood home and touring various countries. The supervisor wished him a pleasant trip.

"I think you are glad that I am going; I give you more trouble than all the others put together," the master mechanic said with a twinkle in his eye. The supervisor protested that the other gave him no trouble whatever, in fact, that he was extremely grateful for his advice and encouragement.

"Very good, then," the master mechanic concluded, "never forget the fundamentals in apprenticeship nor the fact that they are frequently what appear to be the ordinary things. Don't let your boys spend their time on superficially attractive features of their work before they have learned the vital commonplaces."

BLIND ALLEY

M. C. Richmond, Red Bank, N. J.

This short one-act play, which has as its purpose the presenting of the dangers of the "Blind-Alley job," the job that leads nowhere, lends itself for presentation in the regular assembly program by the male members of manual-training or vocational classes.

The use of the suggested costumes and scenery is purely optional. A performance can be given, using the ordinary school properties. Of course, the use of costumes and scenery would make for a more effective presentation. If the school does not wish to go to the expense of hiring the few simple costumes, they might be made in the sewing department of the girls' school. The scenery would make an excellent project for the school shop.

The accompanying illustration will give an idea of the treatment accorded the play by the author in presenting it in a New Jersey vocational school.

CAST

(In the order of their appearance.)

First Attendant
Second Attendant
The Lawyers
The Judge
The Prisoner
The Principal
Gentlemen of the Jury

COSTUMES

First Attendant

Dark trousers, a bright-colored uniform coat.

Second Attendant

Same as for first attendant.

The Lawyers

Long black robes, colonial wigs.

The Judge

Same as for lawyers.

The Prisoner

Everyday attire; a bit disheveled in appearance.

The Principal

Everyday attire; a small moustache.

GENTLEMEN OF THE JURY

Long white beards; horn-rimmed glasses.

TITLE: BLIND ALLEY

SCENE

Courtroom, Some Kingdom, Somewhere

To left of stage, judge's bench. To back of stage, jury box, large enough to accommodate six, sitting in a single row—right end of jury box open. To right of stage, court railing with gate. Table and three chairs in front of judge's bench. Chair against court rail to front of stage; chairs in jury box.

Directions

(When curtain rises, Court Attendants, designated in the script as First and Second Attendant, are engaged in conversation. First Attendant is seated in chair in front of table, his back to audience, his feet resting on table edge. Second Attendant is standing, resting against jury box, facing First Attendant, who is his Superior Officer.)

FIRST ATTENDANT

You're learning. For a beginner, you're doing very well. Here's the key to open the court. *(Picks up huge key which has been lying on table and hands it to Second Attendant, who takes it reluctantly.)* It's almost time to start the day's business. *(He waits for Second Attendant to go but makes no attempt to move himself. Second Attendant stays where he is and regards First Attendant sullenly.)*

SECOND ATTENDANT

(Angrily.) Say, don't you do anything around here? It seems to me I'm doing all the work in this court.

FIRST ATTENDANT

That's because you're learning. When you get to know as much as I do, you won't have to do anything either.

SECOND ATTENDANT

When will that be?

FIRST ATTENDANT

That depends.

SECOND ATTENDANT

Which means nothing! That's all I've heard since I've taken this job, "That depends," and "Do this and do that." I'll suffer just a little longer, then I warn you, the worm will turn. *(Holding up key.)* What do you want me to do with this iron fence?

FIRST ATTENDANT

Just open the court, that's all. But before you do that! Have you got the program of the day's proceedings? There must be no mistakes.

SECOND ATTENDANT

(Takes paper out of his pocket and holds it up.) This what you mean?

FIRST ATTENDANT

That's it. Now read it over to me.

SECOND ATTENDANT

(Reads.) First come the Jury; then we have the lawyers, and finally, the Judge himself.

FIRST ATTENDANT

How about the Prisoner?

SECOND ATTENDANT

Oh, yes. I forgot about him. *(Pointing to paper.)* Here he is. He comes in leaning on my arm.

FIRST ATTENDANT

That leaning business is unnecessary. The rest is fine. See that you remember everything.

SECOND ATTENDANT

(Puts paper into pocket.) O.K. *(Hesitates before going.)* Say, what's this fellow accused of?

FIRST ATTENDANT

He broke our latest law. They caught him in Blind Alley. You ought to be glad you have such a swell job and that you're not in Blind Alley. Hurry along now and open the court. Justice must not be delayed.

SECOND ATTENDANT

(Goes off right muttering to himself.) Swell job! Justice!

FIRST ATTENDANT

He's learning—but just a bit too quickly.

SECOND ATTENDANT

(Enters right, holds gate open—a position he holds throughout trial—and announces): Gentlemen of the Jury!

(First Attendant jumps up quickly and stands at attention. March music is played and Jurors, with right hand extended to shoulder of one in front, march out upon stage from right, first skirting footlights, then when reaching left of stage, turning and marching in front of jury box and then into jury box. They stand in their places and when music has stopped they recite in unison):

We are the Jury,
The critical Jury;
We get small pay,
But we have big fun.
It is up to us
And we make no fuss;
The Prisoner we must judge,
We don't care a fudgé;
But our duty we must do,
Or his work he'll renew,
So start the case
With all possible haste,

SCENE OF ONE-ACT PLAY "BLIND ALLEY," BY M. C. RICHMOND

The Jury is here,
So have no fear.

(*They are seated.*)

SECOND ATTENDANT

(*Announces*): The Lawyers!

THE LAWYERS

(*They enter from either side and meet to front center of stage. They recite together*):

We are the Lawyers,
The Lawyers in the case;
For us, the court
Must always make a place.
Without us, the Prisoner,
We haven't any doubt,
Would find it very difficult
To find his own way out.
But we'll help him,
We'll help him,
Either in or out you see,
Of course we couldn't do this
If it weren't for the fee.

(*They are seated at center table, leaving chair in center for Prisoner.*)

SECOND ATTENDANT

(*Announces*): Everybody stand! His Honor, the Judge.

JUDGE

(*Everyone rises. Enter Judge, right, walks slowly across stage to bench. When in back of bench and before being seated, he recites:*)

You can see
Readily
I'm the Judge.
I'm here most every day,
Hear what people have to say,
Their reasons I must see
And act accordingly.
I always do my best,
Sometimes I takes a rest,
But today I'm wide-awake,
No chances will I take;
Start the case without delay,
Bring in the Prisoner, I say.

(*The Judge is seated; then others take their seats.*)

SECOND ATTENDANT

(*Announces*): A Prisoner of the law!

(*Prisoner enters right, walks dejectedly across stage and sinks into chair between his lawyers.*)

JUDGE

Prisoner, after studying the details of this case, I find that you have been an occupant of Blind Alley, which is a distinct disobedience of the king's law. Have you or your counsel anything to say to this charge?

LAWYER

(*That one nearest footlights, rises and addresses the Judge:*) Of course, your Honor, we can't deny that the defendant was in the Alley, but it was because of others that he got into the Alley.

JUDGE

Do you mean to infer that the Prisoner is a victim of foul play? That someone carried him off and placed him in Blind Alley?

LAWYER

I don't mean exactly that—and yet I do.

JUDGE

(*Angrily.*) You don't—you do! What sort of nonsense is this?

LAWYER

Your Honor, the Alley was made so attractive that the defendant could not help but wander in.

JUDGE

That is neither here nor there. It is a fact, then, that the Prisoner was where he shouldn't have been?

LAWYER

We must admit that, but—

JUDGE

(*Ignoring Lawyer, who sits down as soon as Judge starts speaking.*) Has the Prisoner anything to say before his case is presented to the Jury?

PRISONER

(*Rising slowly and facing Judge.*) Your Honor, I had hoped you might give me this opportunity and I have prepared a statement. (*Takes paper from pocket.*) I trust it will influence these kind men of the Jury (*looks at Jury*) to the extent that they will give me another chance.

(*He reads:*) It is true I was in Blind Alley. I soon found it lead nowhere. I have no one but myself to blame. When I was in the seventh grade I decided to leave school. School didn't mean much to me and I wanted to make some money for myself. The principal advised me to go to a trade school and prepare myself for some special line of work. I did go over to the trade school and register, but just at that time I was offered a position to drive a small grocery truck and seeing an opportunity to make some money right away, I grabbed it. After holding this job a year, I asked for a raise in salary, but the boss told me he could very easily get someone else to do my work for the money I was receiving then. He let me go and my experience was the same with every job I got. Finally, I stopped, looked around, and finding I was no further ahead than when I started, I realized, much to my horror, that I was in a Blind Alley, and because I had no special training, I could not get out. From that point, gentlemen, you know my story. In the Alley I was apprehended by an officer of the law and here I am before you. (*He folds paper and puts it away.*) Gentlemen, I place myself at the mercy of the court.

JUDGE

Gentlemen of the Jury, you have heard the statement of the prisoner. It's up to you to make the final decision. I recommend—

PRINCIPAL

(*Makes an attempt to enter right but is stopped by Second Attendant. He says:*) Your Honor—

JUDGE

Let him go. Why, sir, do you interrupt the dignity of the court in this manner?

PRINCIPAL

(*Crosses to center of stage.*) May I say just a few words?

JUDGE

If in relation to this case, yes.

PRINCIPAL

I am the principal of the trade school where this young man at one time registered. At that time I tried to persuade him not to take that job but he would not listen to me. Through another student I heard he was in trouble, so I rushed here to see if I might not suggest a way that will keep this young man from everlastingly suffering for getting into a Blind Alley.

JUDGE

Just what is your suggestion? You'll have to make it snappy.

PRINCIPAL

It's just this: Why couldn't the prisoner be paroled in my care for the next two years? I will see that he takes a course offered at the trade school and that when he leaves the school he will be fitted for some definite occupation in life. I will even go further to say that I guarantee that instead of being found in Blind Alley, the next few years will find him on Easy Street.

JUDGE

(*To Prisoner.*) Will you agree to such an arrangement?

PRISONER

I will be more than glad to.

JUDGE

(*Standing and addressing Jury.*) Gentlemen of the Jury, you have heard the kind and practical suggestion of this man. You also know the king's law relative to being found in Blind Alley. I might add, the parole is permissible. You may adjourn to the jury room to make your decision. (*He is seated.*)

(*Jurors talk among themselves without rising. Very shortly, the foreman of the jury, the first to the left of jury box, rises.*)

FOREMAN

Your Honor, the Jury wishes to make its decision without leaving the room. It is the unanimous desire of the men assembled here to give this young man or any other young man who wishes to better himself, another chance. We recommend that the prisoner be paroled as suggested to the Principal of the trade school, and we hope this will prove a lesson to other young men and that they will not stumble into a Blind Alley. CURTAIN.

DEVELOPING A VOCATIONAL PROGRAM IN A COMMUNITY OF FEW INDUSTRIES

Homer U. Miles, Junior College, Edinburg, Texas

EDINBURG is a city of approximately 7,000 people, located in the upper part of the lower Rio Grande Valley. It is often spoken of as the "gateway" to the Valley. The Edinburg Consolidated Independent School District is perhaps one of the largest in the state. Its boundary extends south, 4 miles, east, 17 miles, west, 17 miles, and north, 35 miles. Most of this area is cut into sections, quarter sections, and often much smaller tracts with a complete system of roads. Sixteen busses are used to bring 500 children of all ages into Edinburg to school every day.

We have the five-four-four plan of coordinating the junior college with the public-school system. The administration is divided into five groups. In the applied-arts group is placed industrial arts, home economics, business administration, and agriculture for the junior and senior high school and the engineering courses in college.

Our vocational program consists of four classes in agriculture, two full-time teachers in home economics, and one part-time teacher, one class in auto mechanics, one class in building trades, and one full-time teacher of related subjects. We have two part-time commercial classes and one household-service class.

When considering the types of day trade work that should be offered in any community, the question arises, should we include local trades only, or utilize trades common to the entire country? Unless we educate for trades common to the locality, placement becomes impossible. Therefore, it seems to me that both factors must be considered—local placement opportunities and the possibility of placement in other parts of the country in the same trade.

There are certain basic trades in which employment may be had in practically all parts of the country, then if they satisfy the local need we are reasonably safe in offering training in such trades. We have chosen auto mechanics and building trades. I am quite sure that no one will question the future permanency of these trades the country over, and in our section there is a great amount of building being done and much of the country yet to be developed. Edinburg is the county seat of Hidalgo county and the largest city in the county with an auto registration of 14,000 cars. In addition to the usual number of repair stations in a town of this size, service stations and repair shops are found every few miles over the greater part of the area served by our public schools.

The auto-mechanics class has been under way three years. Development and promotion were unnecessary in this class this year. In fact, we had a greater number in both the high school and in the trade class than was able to be accommodated. It, therefore, became necessary to guide some of them into other courses.

The trade class in auto mechanics is on a production basis. A work order is made out for every job that comes into the shop. The instructor assembles his class at the beginning of the period in a portion of the shop that has been provided with tablet armchairs and all jobs are considered by the class as a whole. Some of the bigger jobs that are new to a majority of the class are rolled in on the hydraulic lift where they are in easy view of the class and can be lifted and turned to any convenient position for an explanation of the best method of attacking the job at hand. Boys are assigned the various jobs and work orders are given them with everything listed that is to be done. The instructor then passes from job to job as needed. After the jobs are completed they are inspected by the instructor and his O.K. put on the order sheet when complete.

The building-trades course was started this year. The instructor was new also, and the class was organized a few days after school opened. One of the first things to be done in starting a new course or any new piece of work is to get the school people in sympathy with the work. In a case of this kind it is not so much a matter of converting them to the principles of vocational education as it is making them believe in you and that you are interested in helping the boy.

After some of the rush of starting school was over, the principal asked me to accompany him to see if we could work up some interest in a building-trades class. We went from room to room explaining the work briefly and collected all boys that were interested into a room where we went into the details about objectives of the course, the plan of carrying on the work, and some of the types of work that were to be done. The boys were asked to think the matter over, confer with their parents and then if they wanted the course, to report to the shop the next day. A class of 16 boys reported.

The first job that fell to this class, was to convert a shack 30 by 90 ft. into clubrooms for athletic teams. Several locker rooms were built in and ceiled. A portion of the floor was torn out, drains set, a concrete floor poured and 12 showers installed. The class has since built an extension on a garage, benches for the auto shop and a number of other pieces of equipment for the school. One of the jobs contemplated for the future is to have the class build a house complete from the foundation to the finish paint coat.

The class had the opportunity of building a gymnasium, but this job was not accepted because the sameness of much of the labor meant lack of teaching material.

Production work should offer instruction in trade methods, develop creative ability in designing, teach cooperative and social relations, but should not be carried to the point where the product is the chief objective.

With all the efficiency developed in vocational training, the surprising fact must not be forgotten that many boys and girls decide on a vocation, learn the elements of that vocation in a trade class and succeed in their schoolwork, but in the process of their learning broaden their horizon and choose another occupation. Even specialization must not be too narrow—vocational training must not close the doors to opportunity—it must and should open several avenues. As the students advance they are likely to experience a progressive rising and clarifying of the vocational aim.

In the part-time school, I believe wonderful opportunity is offered for the education of the employed boys and girls. We are enabled through these classes to develop the pupil who has high capacities but who has been forced by economic pressure, or for other reasons, to enter employment. Everyone in this group may be developed socially and given a broader background for that happiness and appreciation of the things with which they must work and by which they will be surrounded according to each individual's capacities and aptitudes.

Part-time education becomes almost an individual matter. Given the exceptional teacher, its possibilities are unlimited, and the larger the city, the greater the opportunity for the division of groups into units large enough for economical administration and for education best suited to the needs of the individual.

When we were ready to begin our campaign for part-time classes, we had a visitor from the extension department of the University of Texas. We started with a talk before the Rotary Club in which part-time education was fully explained This talk was given publicity in the papers. Some enrollment cards were prepared which called for such information as the following: Name, age, address, phone number, employer, nature of employment and choice of subject as, bookkeeping, typing, shorthand, and business English, and the choice of two hours for which we had previously found that school equipment would be available.

After a sufficient number had been enrolled for us to feel reasonably sure of a class, we turned our attention to a household-service class for Mexican maids. An interview was arranged with the president of the Federated Women's Club who called a special meeting of the club. All the clubs were represented at this meeting except one. These representatives went away very enthusiastic about the work and agreed to take the matter up in their respective clubs. A committee was appointed to cooperate with the local director in enrolling maids for the class. The class was organized two weeks later with fourteen present and the addition of four at the second meeting of the class.

The organization of an evening school for those in industry presents a still different problem. The first thing is a consideration of which trades or portions of trades can be taught effectively with the equipment found in the local school system. Only a few schools in the smaller industrial communities have well-equipped shops, woodshops being perhaps the exception. Therefore, the instruction given must be confined largely to related subjects where little equipment is needed.

It is, of course, easier to hold the interest of the student if a shop is equipped to teach the practical shopwork rather than related information. This is true, because most men appreciate that in practical shopwork they can get something that they can apply immediately. This is not always so with related subject matter, as some of it will be of no value for perhaps a month, or a year or two years.

It has often been found convenient to teach parts of trades in short units which can be accomplished in a few weeks' time. Most men will attend evening school regularly for a period of ten or twelve weeks. The next year another unit can be taught, and so on. Then, too, some men want one part of the trade and some another, and for this reason it is highly desirable to have the work offered in short units.

Men who enroll in evening school are usually concerned with getting something that will help them to the next best job as soon as possible. They do not want in the related subjects, a general course in science or drawing—valuable as it might be—but the science and the drawing, that they want and need, must have specific value. There will be no danger of getting too much theory if a practical man has been selected to do the teaching, but this will have to be guarded against if an academically trained man has charge of the class.

To organize an evening class the local director may arrange to appear before a labor organization at one of their meetings and discuss with them the need for a certain kind of work for their men. Enrollment cards may be given out at the meeting and the group given directions for the first meeting of the class. Sometimes a committee may be appointed from the organization to assist in the enrollment of the class. In some of the smaller communities the labor organizations will not have much influence and in all localities it will be found that some crafts cannot be reached in this manner.

When individual enrollment is necessary, much time may be saved on the part of the director if he will first secure a competent teacher, give him such preliminary directions and training as is needed for the first few meetings and designate a time and place for the class to meet, before attempting to enroll anyone for the work. This having been done, every man approached can be given complete instruction at one interview.

The purpose of the evening schoolwork is threefold: to make a better producer of the man for his own sake; to increase the efficiency of the plant in which he works; and to increase the efficiency of industry in general.

Each school system has its own problems and its own districtive opportunities for service. Nevertheless, it is but a part of a great national plan. It succeeds or fails according to the measure in which it achieves the educational ideals of the nation as a whole.

WHICH PAPER SHALL I USE?

Richard H. Behrens, University of California, Berkeley, Calif.

SINCE PAPER serves as the supporting medium of printed matter, it is one of the most important—if not the most important—material used by the printer in his trade. Since he is called upon to make a great number of judgments in determining the needs of the different jobs, the good printer must be a good judge of paper; and to be a good judge of paper he must have had firsthand experience with a great variety of papers under a great variety of circumstances. The responsibility of providing this experience under guidance may properly be placed with the teacher of related science for the printshop.

The following instructional block in trade science, consists of a group of tests made with simple apparatus, a number of assignments, and a group of jobs with which the results of these tests and the findings of the assignments were correlated, was designed primarily to enable the apprentice to acquire facts upon which he could base his judgments. Many of the tests are thoroughly practical for use in future employment,

but the boy is not expected to remember any of the tests with a view toward future application. The tests are designed to develop judgment rather than specific procedures in dealing with facts.

Besides the various testing apparatus hereinafter described, only a few chemicals, and a supply of paper samples such as may be obtained from paper jobbers, catalogs of papers, price lists and job specifications, and from texts on printing and paper, are necessary to work out the entire unit.

A master list of a variety of jobs was first developed; each job was numbered and furnished with the necessary descriptive details. The following job is typical of those composing the list. A poster, advertising the Stanford-California football game, is to be printed in three colors. A job such as this requires a certain amount of judgment on the part of the boy. He must consider the influence of the weather, because these posters are going to be used on the outside, and since the game is played in November, fog, rain, and sunlight must be considered. He must also choose a paper suitable for color work. Similar jobs require the printing of labels for soda-water bottles, automobile maps, handbills, legal forms, and business forms. Old job specifications which have been secured from commercial printshops are also studied.

Tint in Papers

The unit devoted to the study of tint in papers, points out the importance to the printer of variability in two batches of the same kind of paper ordered at different times from the same manufacturer. Attention is called to the problem of securing uniformity in a large job for which more than one delivery of paper would be required. Each pupil is given ten sheets of "white" paper of approximately the same surface, but ordered at different times from different manufacturers. The students are instructed to cut the papers into strips, measuring 1 by 6 in., and to lay them side by side on a flat surface with diffused light coming from the back. The sheets are lettered so that they can be identified, and the student must then number them in the order of their hues, increasing from light to dark.

A sheet of white paper is then selected, and the student is given an opportunity to match this against a number of other sheets which are given to him.

Finally, a large sheet of paper is cut into a number of smaller sheets. One of these sheets is then matched with another sheet superimposed on the rest of the cut sheets. In this way the boys discovered the danger of comparing a single sheet with several sheets.

The Surface or Finish of Paper

This unit deals with the importance of the finish or surface of printing papers. Since printing papers vary from the very rough to the smooth, highly glazed papers, it is necessary that the training of the printer includes some experience with this important characteristic of paper and its significance for the finished product of his trade.

To provide this experience, three tests are made: one, depending upon the "feel" of the paper; another upon the appearance of the surface of the paper when viewed with the eye slightly above the level of the sheet; and a third test, quantitative in character, which is carried out by means of the apparatus hereinafter described.

A number of representative printing papers are marked to permit of identification. They are then given to the student, who is instructed to pass his hand over the surfaces of the papers for the purpose of judging their relative smoothness or roughness of finish. The student is then required to list the results of his judgments in tabular form.

A second column is added to this list for the second test. The student views the different kinds of the papers with his eyes at the level of the surface of the paper and then arranges the sheets in the order of their relative degrees of smoothness.

The third test is made by means of a piece of apparatus which consists of an adjustable plate of glass which can be tilted to any angle and to which the paper to be tested is attached. A smooth weight is placed on the paper and the apparatus tilted until the weight begins to slide. At this point the angle is measured with a protractor and the number of degrees are tabulated. The greater the angle, the rougher is the surface. The apparatus is shown in Figure 1.

After the three tests have been completed, the student is asked to compare the results of his three tests; and finally, he is asked to suggest, on the basis of his findings, the type of paper best suited for each of a number of jobs.

Weight and Thickness of Paper

Thickness and weight of paper are items of the greatest importance to the printer who must satisfy the various demands made upon him by the commercial world. In the general practice of printing, the designation of papers on the basis of weight and thickness is a recognized procedure. In this unit the student is required to find the weight of a ream of several papers of different sizes by rolling up a sheet of the standard size paper, tying it at the middle with a fine thread to prevent unrolling, and weighing it on a balance. A thread of the same length as that used in weighing is placed on the weight side of the balance as a counterpoise. The weight so determined is converted arithmetically into the weight per ream of the paper, and the results for each paper to be tested recorded.

The thickness of the paper is determined by measuring a sheet with a caliper micrometer such as is commonly used in the machine shop. The reading is made to the nearest half thousandth of an inch. A variety of papers are provided for this test and the results are recorded by the student as usual.

On the basis of the results obtained in these tests the student was required to specify the weight and thickness of paper which he would choose for several given jobs.

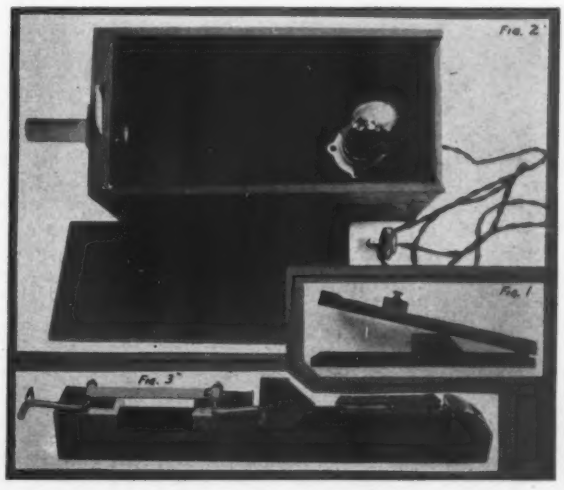
Texture of Paper

In the finer printing jobs, "wildness" and unevenness of the wire mark in the paper may prove sources of much trouble. To test for these defects the pupil was asked to hold several sheets of different kinds of paper to the light, and to look for "wildness," which is manifested by an irregular, patchy, or cloudy appearance of the paper. Very cheap papers serve best to illustrate "wildness." When the wire marks are examined for sharpness and unevenness, the watermark should not be neglected.

In connection with this unit the student was required to list those jobs in the master list which would permit the use of paper not entirely free from "wildness."

Opacity of Paper

The opacity of paper is often a criterion of quality; thus, while an excessively transparent paper may be lacking in strength, a very opaque paper may suggest the existence of a



large amount of mineral matter. Improvements in printing and in paper making have made possible the use of very thin papers without too great a loss of legibility through the absence of opacity. When thin papers are to be used on a job, great care must be exercised in selecting paper with sufficient opacity to guarantee legibility. For the purpose of studying opacity in paper, the student is provided with a white sheet of paper upon which a ten-point line is printed. He is asked to place upon this sheet as many sheets of thin paper as are necessary to destroy the image of the line. In this way the student makes a rough comparison relative to opacity in the various papers given him.

A more delicate comparative test is made by means of an apparatus consisting of a closed box having an incandescent light at one end, and a peep hole at the other, with a slot between through which sheets of paper may be slipped until no light can be discerned by the eye looking through the peep hole. Figure 2 shows the construction of the opacity apparatus.

Relative opacity is expressed numerically by choosing the thickest paper as unity; for example, if 2 sheets of paper .008 in. in thickness and 8 sheets .004 in. in thickness are required respectively to blot all light, then their relative opacities would be as $2 \times .008$ to $8 \times .004$, or as 1 to 2. The determination of the thickness of the two papers is made by means of the test for thickness of paper given in the unit dealing with that subject.

Upon the basis of the relative-opacity figures which are obtained in the experiment, each student is required to specify the limits of opacity which he would demand for a number of given jobs.

Cleanliness of Papers

Imperfections in paper may occur in the process of manufacture, and are often found in the cheaper varieties of paper. Sometimes an occasional sheet of fine paper shows defects. Since the presence of impurities in the paper are apt to leave a bad impression of the printing job, it is a matter of considerable concern to have paper without defects for the finer jobs. To test for these imperfections, the student is given a number of papers of all grades. He is asked to hold the sheets up to the light to examine for pin holes, and to note their presence on the paper in case he discovers any. The paper is examined with a magnifying glass which enlarges seven times in an attempt to determine the presence and probable nature of spots and specks, such as sand, dirt, knots of fiber, pieces of rubber, sealing wax, lumps of mineral matter, and rust and resin spots, all of which may be found in paper. A circle is to be drawn around each defect found and a number assigned to each mark. The student is expected to indicate what seems to him to be the probable nature of each defect.

The student is then asked to render judgment as to the amount of defects, if any, that are permissible in a number of given jobs.

Ink-Bearing Properties

The sizing used in making a given piece of paper determines to a large extent the purpose for which it may be used. A well-sized paper is required when any amount of ink writing is to be done. On the other hand, papers which are not to receive any ink may require little sizing. A fair estimate of the ink-bearing quality of any paper may be had by pressing the tongue against the sheet for a few seconds; if the sizing is poor, the outline of the tongue can be plainly seen upon holding the paper to the light, because the paper will appear saturated, flabby, and transparent. A number of sheets are tested in this manner by the student.

Another test, which consists in determining the amount of time necessary for an alcoholic solution of an aniline dye to penetrate to the other side of the paper may be used to good effect. The solution consists of a small amount of aniline blue dissolved in commercial alcohol. The student, using an ordinary medicine dropper, places one drop of the solution on each sheet which he is to test. Only a few sheets are to be tested at a time so that the experiment may be made as accurately as possible. The time when the drop is applied is noted. The papers are turned over quickly after the drop has been applied so that they can be examined from the back. The time needed for the penetration of the dye is then noted. The paper through which the dye penetrated most quickly, is the one that contains the least sizing. After finishing this experiment, the pupil is required to render judgment concerning the amount of sizing permissible in paper to be used for a number of given jobs.

Strength

The quality of paper is to a great extent dependent upon its strength. The strength of paper, which is its resistance to breaking or rupturing stresses, is dependent upon the character of the fiber used in its manufacture, and to a certain degree upon the accuracy of the felting process. The comparative strength of various papers is, therefore, a matter of vital concern to the printer. In order to gain an idea of the relative strengths of some of the more commonly used printing papers, the pupil is given the problem of determining their breaking point in the apparatus shown in Figure 3.

This apparatus consisted of two slotted winch handles; one (A) fixed, and one moving on a small wooden carriage (B) mounted upon the body of the apparatus. The movable carriage is attached to a spring balance with a capacity of 25 lb. A strip (1 by 13 in.) of the paper to be tested is inserted with one end in the slot of the winch on the movable carriage, the winch is given a couple of turns to secure good purchase on the paper and locked by inserting a nail (C) through a hole drilled in the winch and in the carriage below. The other end is then drawn taut in the fixed winch and the turning continued while the wedge (D) is pressed into the groove at the movable carriage end to take up on the movement of the carriage. When sufficient force is expended by turning the fixed winch, the paper breaks, the wedge holding the spring balance in position until the reading can be taken. The pupil records his findings on the list of papers which he tests. He is also asked to decide upon the necessary or desirable strength of each paper to be used for a number of given jobs.

Folding and Crumpling Strength

A large amount of printed matter, such as maps, checks, circulars, etc., must show considerable resistance to folding and crumpling. A simple test of the folding strength of paper is made by the pupil on several different kinds of paper. The test is made by folding the piece of paper repeatedly in the same place, and at intervals the paper is given a gentle pulling motion. The number of foldings which the paper can stand before it breaks, is then recorded by the pupil. A similar simple test is used in determining crumpling strength. The paper to be tested is cut into pieces measuring about 4 by 4 in. It is then crumpled repeatedly in the hand, opened up after each crumpling, and examined for holes. A record is made of the number of crumplings necessary to produce holes. After this test, the student is given demands of a number of jobs. He must then study them with regard to the folding and crumpling strength of the paper, and record his judgments.

Color Permanence

Paper which is to be exposed to sunlight for shorter or longer periods of time must be reasonably fast. White papers frequently become discolored, and colored papers fade very rapidly in the sunlight. In determining the color fastness of paper, the student is required to expose the paper to be tested to sunlight for 48 hours. Part of the paper is covered with a disc of black paper. The degree of fading is then estimated by comparing the exposed portions of the paper to the portion protected by the black disc. Resistance to moisture is an important consideration for the printer who has to choose paper suitable for posters which are to be exposed in rainy and foggy weather, or paper to be used for bottle labels, etc. To test the resistance of colored paper to moisture, the student is required to soak several colored sheets in warm water. The

color in papers with little resistance to moisture begin to run very soon. After this test, the student is again asked to render his decisions on the requirements demanded by a number of assigned jobs.

Chemical Tests

The presence of considerable amounts of wood pulp in papers is undesirable if the finished product is to have any sort of permanency. The presence of this fiber may be easily determined by wetting the torn edge of a strip of paper with a solution of 1 part of phloroglucinol in 25 parts of chemically pure hydrochloric acid and 25 parts of distilled water. Having completed this test, the student is asked to record his results and to interpret their meaning for the printer by means of a number of assigned jobs.

Printing Qualities of Paper

Of prime importance to the printer is a comparison of papers from the standpoint of their printing qualities. The pupil was asked to make a comparison of the printing qualities of different papers by running them off on a printing press, at the same time and under exactly the same conditions. He was afterward required to judge the brilliancy and solidity of the various printed sheets and to render decisions on the suitability of different kinds of paper for various commercial demands.

Evaluation of Paper

In writing up the results, the student is asked to record them in tabular form. The name or other designation of the paper is entered in a vertical column, and the results of the various tests in horizontal columns. For purposes of review, the pupil must, furthermore, make a concise summary of each paper tested and discuss its value and use in the printing trade.

In order to give the boy an opportunity to integrate his results, the teacher furnishes him with certain job specifications, prices of papers, standard prices charged in the trade, and necessary equipment, and requires him to select the most suitable paper for the job. In addition, the boy is called upon, before setting up a job in the shop, to decide on the basis of available papers, the paper best suited for the proposed job. In this way the limiting conditions of actual trade practice are introduced to a fairly high degree.

The foregoing instructional block in industrial science, furnishes a fundamental background upon which the boy may, after admission to journeyman rating in his trade, in an intelligent manner project his future judgments concerning the most important material of his trade—PAPER.

PAGING MR. "IF I. ONLY"

Lawrence Parker, Kansas State Teachers College, Pittsburg, Kansas

Have you ever met a gentleman of this name? There are as many of them as there are John Smiths, and we find some of them in almost every town we visit. I suppose that some work for other folks besides the superintendent of schools, but there is where our work brings us in contact with them, most often.

Many of them sign a different name to their checks but you can easily recognize them by their conversation. They reveal their true identity soon after you first meet them. Some of those who work as manual-training teachers make some of the following remarks:

"If I Only" had more equipment, I could make a better showing.

"If I Only" had better equipment, my boys would turn out better work.

"If I Only" had a free hand in the planning of the courses, you would see a much better class of work going on here.

"If I Only" had smaller classes, you would not find so much confusion in the room.

"If I Only" had more material and of better quality, my boys would surprise you.

"If I Only" had larger shops and not so crowded, etc., etc.

Probably there is not a single manual-training teacher who is satisfied with all of the working conditions which surround him. It is a very healthy sign if he is not satisfied. The satisfied manual-training teacher is much like the hunting guide in an old story we remember. A hunter reached the point where his guide was to have met him, only to find he was not there.

An old Indian, in answer to the questions of the hunter, said, "Oh, he's dead!"

"How long dead?" asked the hunter.

"Oh, long time. Two, three years."

"He can't be," said the hunter, "for I had a letter from him last week."

"He's dead, only he just ain't fallen over yet."

Mr. If I. Only, however, takes out his dissatisfaction vocally with visitors instead of using more practical and effective methods of getting things the way he wants them. He spends his time and energy in talk.

Mr. If I. Only should realize that superintendents are busy men who buy things on bids carefully detailed on paper as the result of requisitions from department heads. Boards of education build school buildings from carefully worked out specifications and the most complete plans they can have drawn for them. Principals run their schools, using written schedules as a basis. All of these people know less about manual training than does Mr. If I. Only, and they must be shown in black and white just what is needed in the way of equipment. They must be shown a list that includes catalog numbers, the maker's name and address, as well as a close estimate of the cost of the equipment installed in the shop. The same holds true of materials and small tools. "The greatest trouble with teachers," said a superintendent the other day, "is their utter lack of any knowledge of what I must have as a basis for intelligently ordering the things they need in their shops and classrooms."

Once in a while Mr. If I. Only tells us that he *did* go to all the bother of writing up his plan or getting out his list but he was turned down. That lets him out, so he thinks. Of course, it does give him a sort of alibi, for he thinks that he has passed the buck to his superior. He has not really tried, though, with the average executive, when he has put up the matter just once. No one sells life insurance or automobiles to the prospects in one attempt. If the first interview does not turn the trick, they vary the method and use different arguments, and after a while they either get the order or they can honestly say, "it can't be done."

So, when you page Mr. If I. Only and you run into him, tell him that if he will use half of his leisure time for a few weeks getting his plans down on paper and then sell and resell the idea until they belong to "the higher ups," he will have turned out to be a real teacher of his subject and not a Mr. If I. Only at all.

Work done by apprentices in the painting and interior-decorating class of the Milwaukee Vocational School, Mr. H. J. Wagner, Instructor.

INDUSTRIAL-ARTS MAGAZINE

EDITORS

E. J. Lake *J. J. Metz* *S. J. Vaughn*

OUR GREATEST PROBLEM

In our problem of educating young boys to have an appreciation of industry and industrial processes, or to enter industry as apprentices, let us not forget that the great aim of education is the training for citizenship, which includes ethical character.

It was Ruskin who said, "All education should be moral first; intellectual secondarily." This statement is just as true today as it was then and perhaps the truth embodied in it is needed more today than ever before on account of the increased complexity of society.

The average shop teacher has more opportunity to give the boy this part of his education than any other classroom teacher for, as a rule, he is in closer contact with the student. Not all shop teachers make the most of these opportunities, but we are sure that as a body, the shop teachers do as good or better work along this line than is done by any other group of teachers.

This subject of moral training is one which, at present, is receiving the major consideration of all the fundamentals on our educational program. It is being preached by prominent business men, school officials, lecturers, and even President Coolidge has mentioned it on numerous occasions.

If we care to read the handwriting on the wall, we should take stock and place more stress upon this very important part of our work. Those who have placed the major emphasis upon the mechanical skill of the student should think beyond the narrow confines of their shops. Those who have always stressed character formation, and this includes most of the vocational teachers, should make a renewed effort to carry on to an even greater degree.

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TRADE CONTENT VS. TRADE CONTENTMENT

Raymond W. Perry, state supervisor of trade and industrial education for Rhode Island, makes the following very pertinent remarks in the December, 1927, issue of the "Trade and Industrial Bulletin," published by the division of vocational education of the public-education service.

Mr. Perry's article contains a message which ought not to be ignored by any trade teacher. He says:

"Every trade or occupation has a definite and particular body of content. Trade knowledge should be familiar to the skilled teachers of trade and industry. It has been analyzed and discussed in teacher-training classes, trade magazines and in many books upon vocational education.

"When the word 'content' is used in its adjective form, 'contented,' it has an entirely different meaning and becomes a condition of trade teaching that has very wide and important possibilities. This condition is very often overlooked and neglected by teachers in their desire to turn out workers.

"This condition of contentment is of vital importance to the worker, the industry, and to society. It has long been recognized that the attitude of the worker toward his work is usually more significant than any other particular condition in determining success.

"A man's success is not to be measured by wealth alone; the discontented worker generally is an inefficient workman and can see little more to his job than its result in wages.

"The idea of finding joy or contentment in honest work is not new. Back in the fourteenth century, when the allegorical figures of the Seven Deadly Sins came to Piers the plowman, asking the way to truth, Piers the plowman refused to leave his plowing and lead them. Instead of leading them he set them all to honest toil as the best possible remedy for their vices, and the shortest way to truth.

"Industry has in it the elements of faith, character and romance associated with the highest callings. Millions of workers in the great industries of our cities, workers high up on the steel girders of our skyscrapers, workers far down in our great mines, even the workers in the little shops of our country villages are quietly working out that calling in honesty, truth, and contentment.

"How far these qualities will carry one has been demonstrated over and over again. Faith, a love for adventure combined with business enterprise, sent Columbus across the Atlantic. The economic needs of their day led Arkwright to apply steam to power transmission, sent Elijah Osborn's steamboat up the Seekonk, and helped Morse to invent the telegraph. Henry Ford, once an obscure mechanic, put all the world on wheels. The hospitable stove of the little shop in the country is a center for political discussion, the formulator of public opinion as well as the publication of village gossip.

"My grandfather carried produce twenty miles over a country road (which is now a famous boulevard), to the great Quincy market, reaching Boston by daylight. My other grandfather was a shoemaker, performing every operation by hand and finding joy in the labor. He reminded me of Gabriel, The Contented Locksmith, so jovial and perfectly happy was he in his work. If for no other reason I came naturally by my zeal for the good name and high calling of industry.

"No discontented workers ever invented a way to send a message flashing across space from a distressed ship, nor found more efficient ways to increase production. Such workers will do little for upbuilding civilization. The contented worker may go far, especially if he has vision and a knowledge that we are still living in an age of romance—an age of Industrial Romance."

—⁂—

DRAFTING STANDARDS

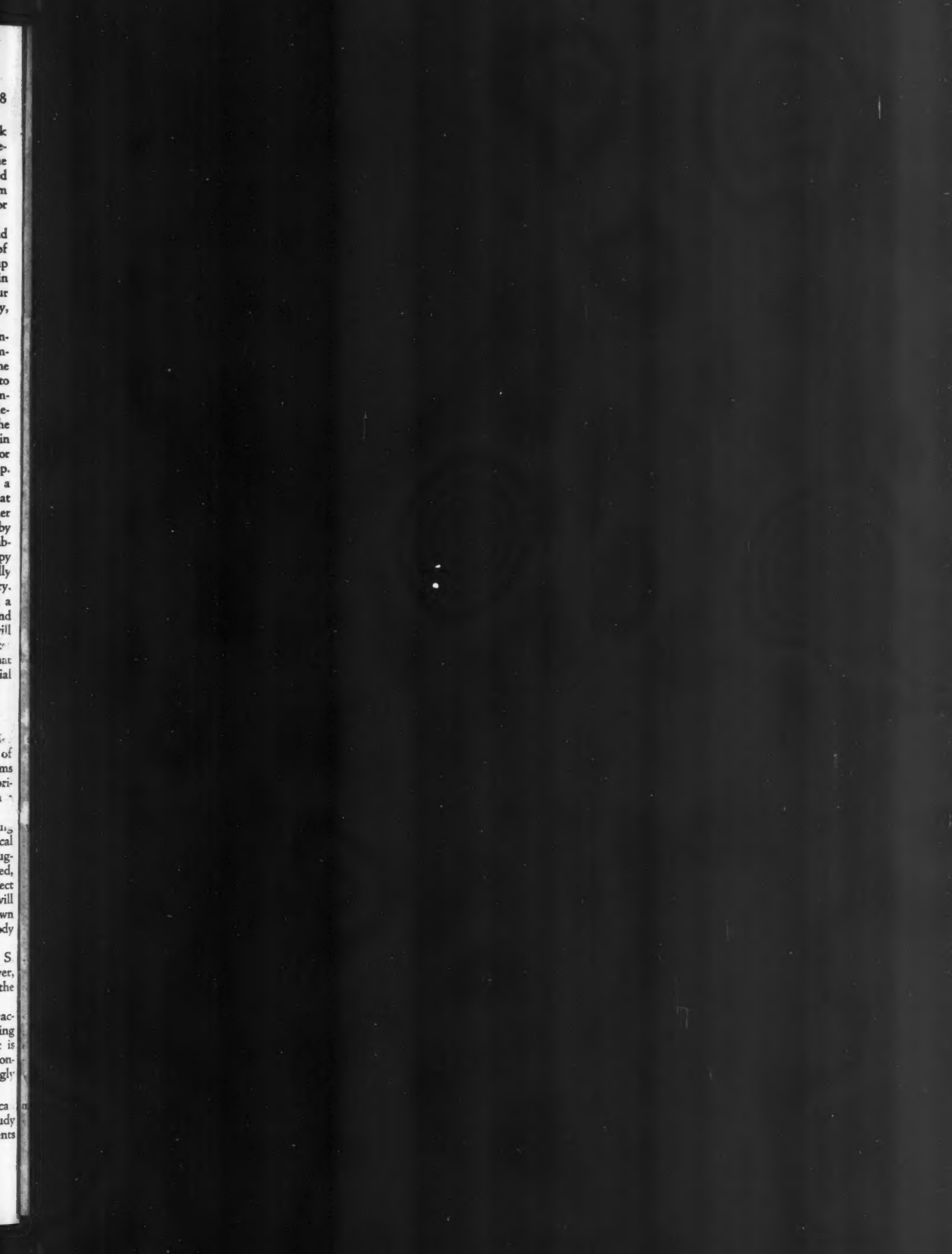
The agitation for definite standards for drafting practice has been going on for years. Investigations in the form of questionaries to both schools and industrial drafting rooms have been many. However, the findings of these small private groups have not had the necessary support to result in a recognized set of standards.

It is gratifying to know that the committee on drafting standards, appointed by the American Society of Mechanical Engineers, will investigate this subject thoroughly and suggest standards which, no doubt, will be generally accepted, when adopted by this national organization. We may expect some definite results from this investigation, for industry will be more ready to adopt standards formulated by their own official body, than a set of standards formulated by a body of school people.

Granting that in a few years the findings of the A. S. M. E. committee will be universally adopted, which, however, is not at all a certainty, what is the safe attitude for the schools to take at the present time?

To answer this question we must look to industrial practice and attempt to prepare our students, whether in reading or making drawings, to fit into the industrial world as it is today. Industrial drafting-room practice reveals quite a conglomeration of standards, some good and some exceedingly poor.

To the wide-awake drafting teacher this situation can mean but one thing—we must include in our courses of study all the standards used by industry, if our graduate students



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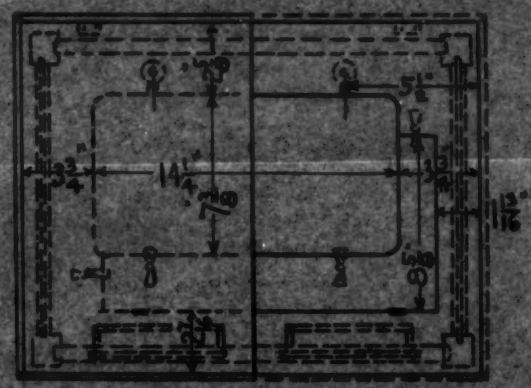

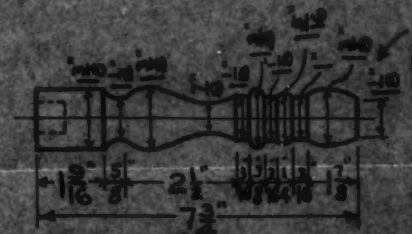

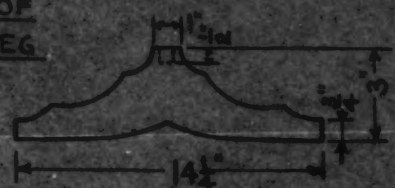

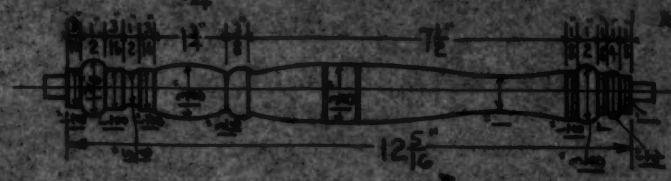

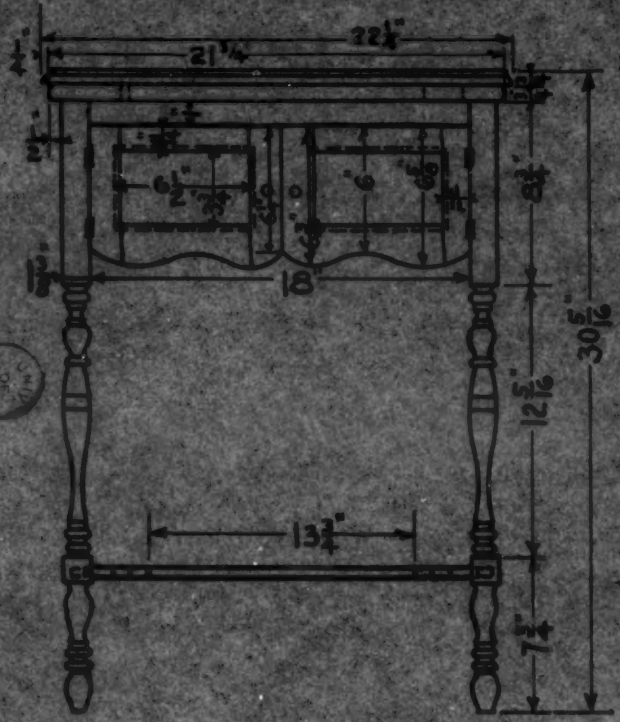

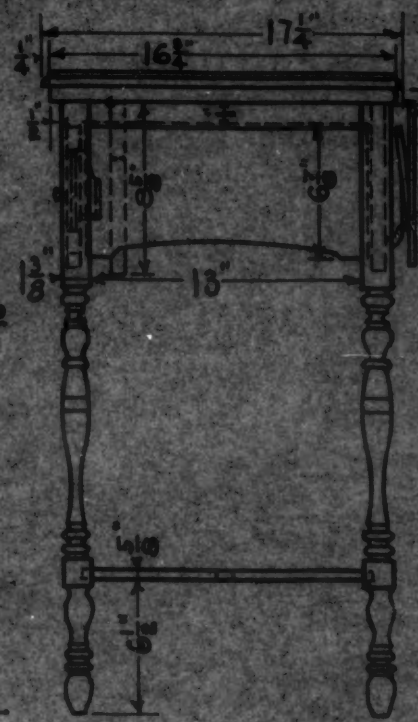

NO	NAME OF PART	TH	W	L	MATERIAL
1	TOP	3/4	17 1/4	22 1/4	WALNUT
1	MACH. TOP	3/4	16 3/4	21 3/4	"
4	CORNER POSTS	1 3/8	1 3/8	8 3/4	"
4	UPPER LEGS	1 3/8	1 3/8	12 5/16	"
4	LOWER LEGS	1 3/8	1 3/8	7 1/4	"
1	FRONT RAIL	5/8	1	19	"
1	BACK	5/8	7	19	"
2	END RAILS	5/8	1	14	"
2	STRETCHER ENDS	5/8	3	14 1/4	"
1	STRETCHER	5/8	3/4	14 3/8	"
4	DOOR STILES	5/8	1 1/2	7	"
2	UPPER DR. RAILS	5/8	1 1/4	7 1/2	"
2	LOWER " "	5/8	1 1/8	7 1/2	"
2	END PANELS	1/4	7	13 1/2	3 PLY WAL.
2	DOOR PANELS	1/4	3 1/4	6 1/2	" "
2	POCKET FRONTS	1/4	1 3/4	5 3/4	" "
4	" ENDS	1/4	7/8	3 3/4	" "
2	" BOTTOMS	1/4	7/8	5 1/4	" "

CONSOLE TABLE FOR ELECTRIC SEWING MACHINE

Designed by Floyd J. Smith, Miles City, Mont.

For Description See Page 298, Industrial-Arts Magazine, July, 1928.

TRACING SUPPLEMENT No. 100
THE INDUSTRIAL-ARTS MAGAZINE
JULY, 1928

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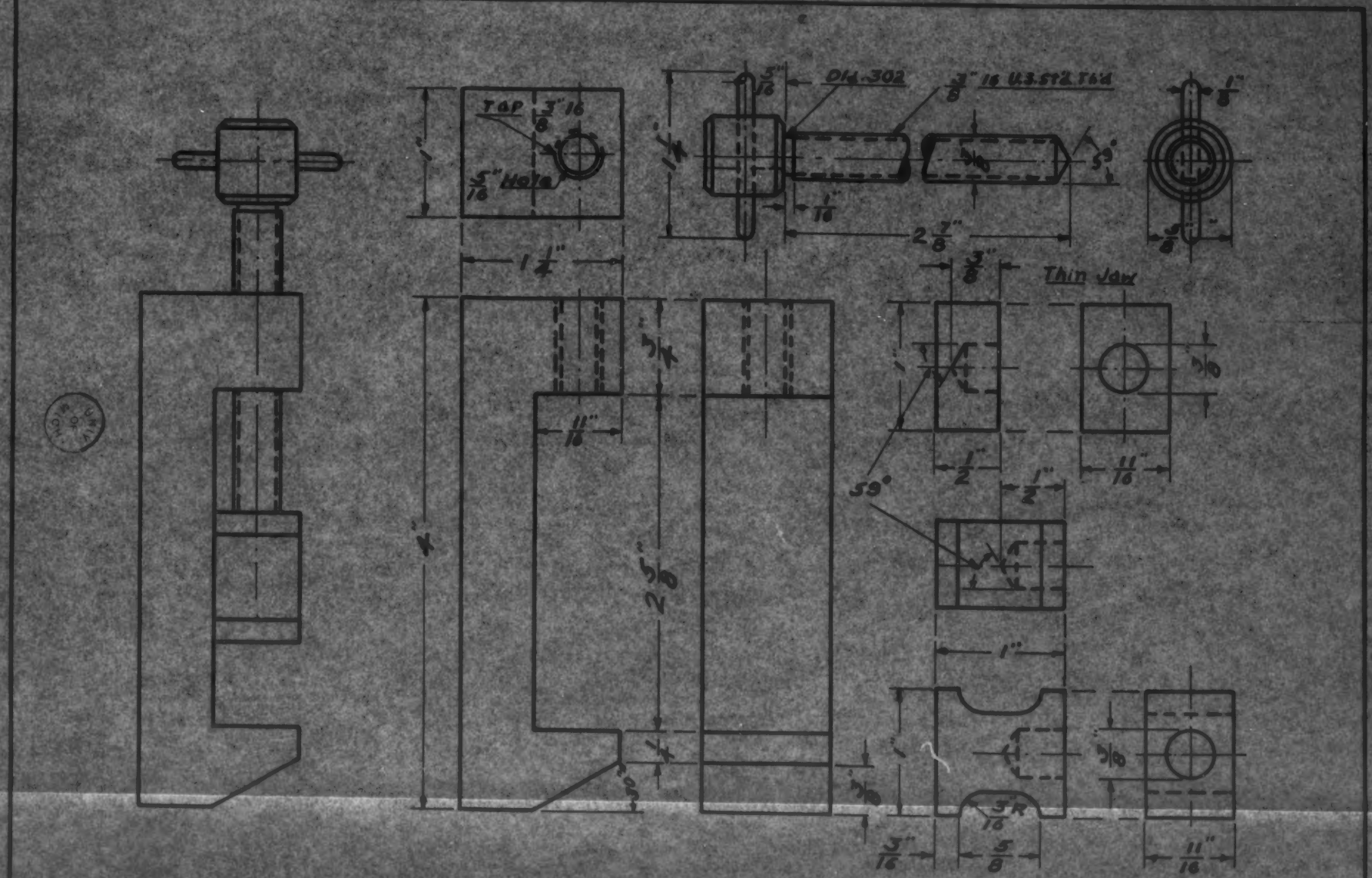

TOOLMAKERS CLAMP

A.F. Ahr

Designed by Arthur F. Ahr, Buffalo, N. Y.

For Description See Page 238, Industrial-Arts Magazine, July, 1928.

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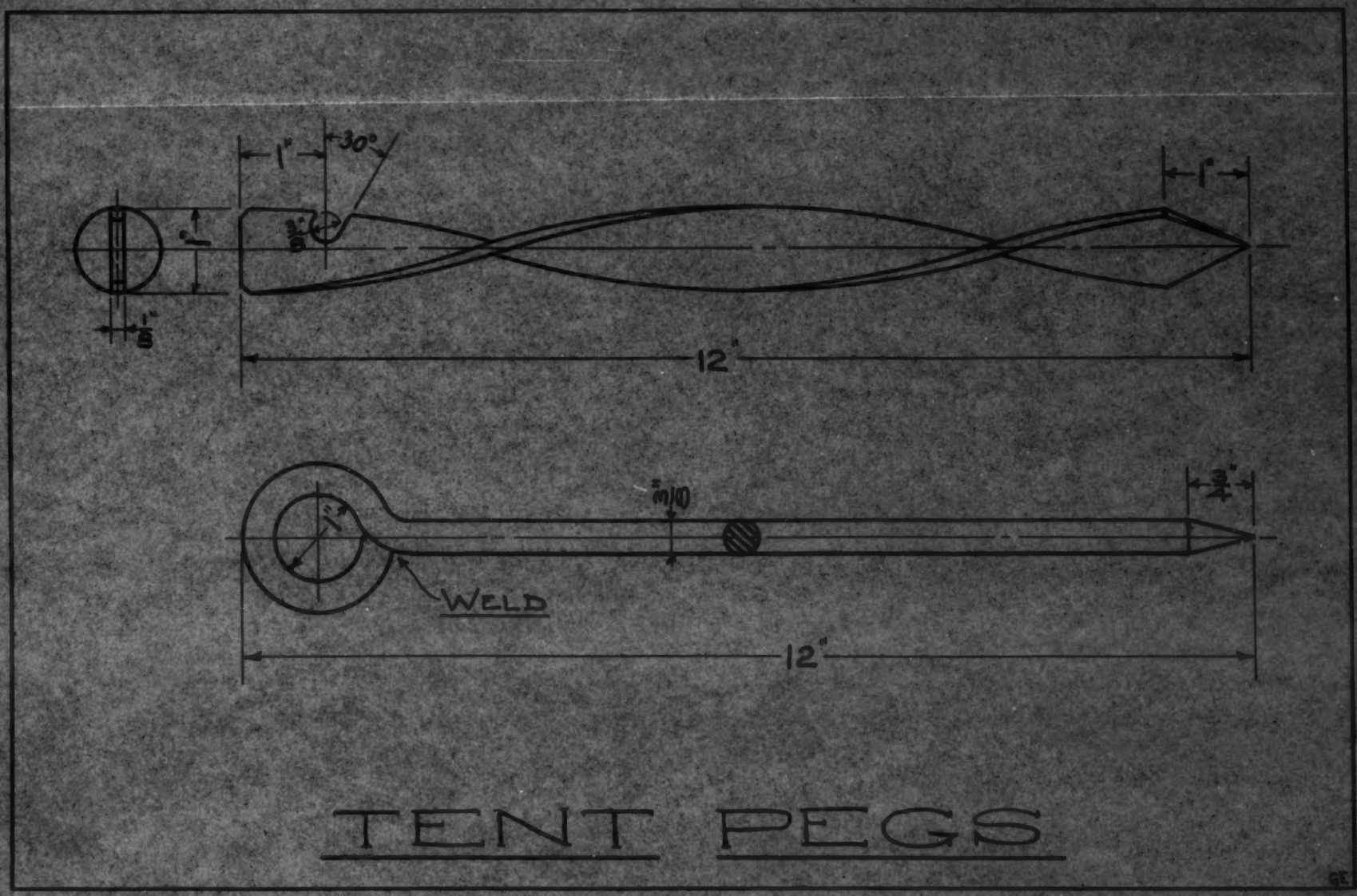

TENT PEGS

Designed by H. D. Campbell, Chase, Ill.

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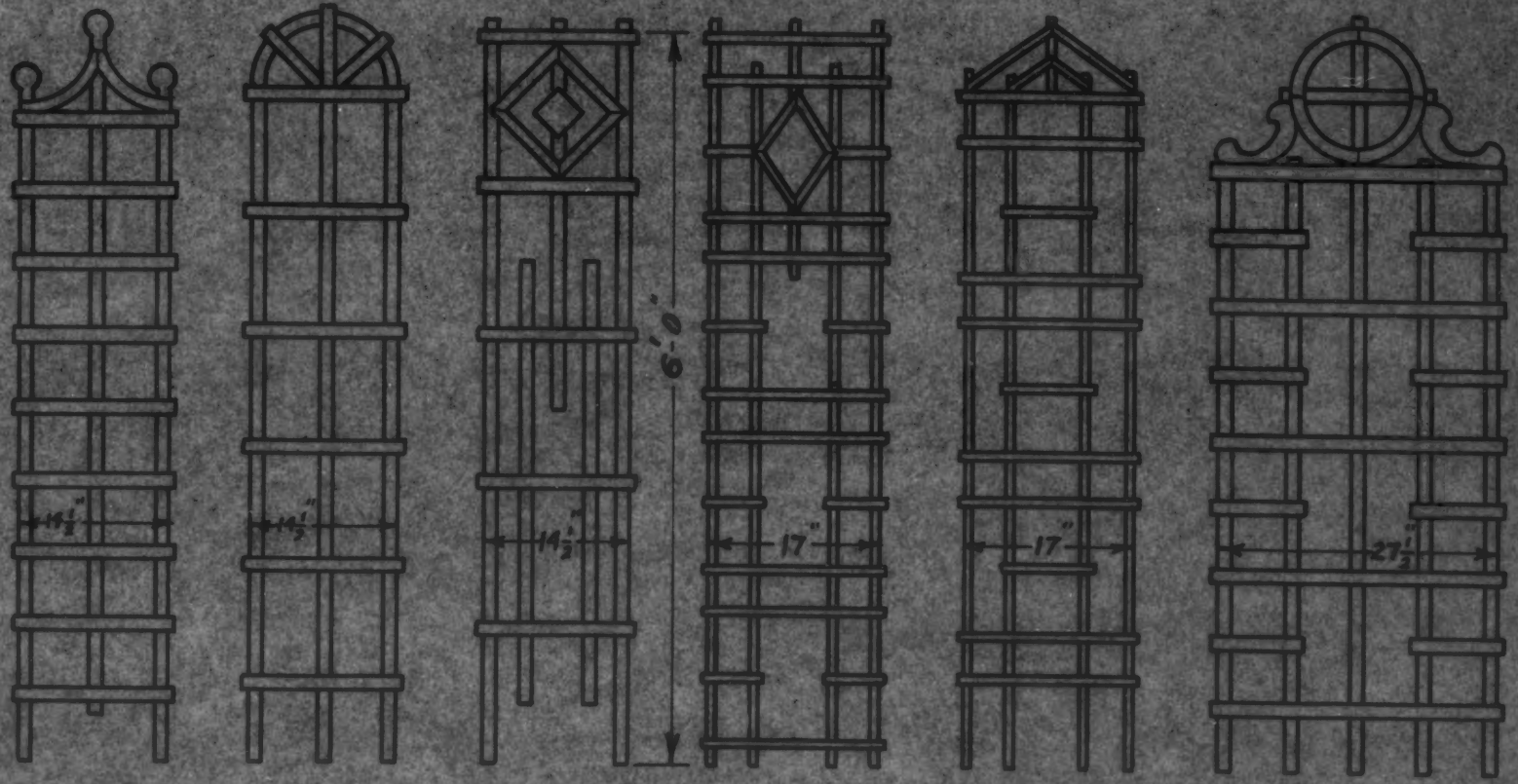

TRELLIS DESIGNS

NOTE — THE DIMENSIONS OF THE LUMBER ARE NOT SPECIFIED AS ANY ONE OF A NUMBER OF SIZES MAY BE USED. FIRST MEASURE THE SPACE TO BE FILLED BY THE TRELLIS AND THEN RIP SOME STRIPS AND LAY THEM OUT ON THE FLOOR TO DETERMINE THE MOST SUITABLE PATTERN AND SPACING.

Designed by Jos. J. Lukowitz, Milwaukee, Wis.

See Description For Page 238, Industrial-Arts Magazine, July, 1928.

are to cope successfully with industrial blue prints when they encounter them. The drafting teacher may have his preference for the weight of lines, methods of drawing threads, etc., and he may be justified in stressing his choice, but it is not fair to the student unless all the standards frequently used are drilled upon. The very fact that the A. S. M. E. recognizes that there is a more or less arbitrary standard at present, should be taken as an indication that no teacher should set up a definite standard for his classes.

Although drafting standards are many at present, and although many of them conflict in minor details, yet it may be hoped, that the time will soon come when the A.S.M.E. will clear up the situation. In the meantime, schools must cover much useless work in their courses until the time comes when they know exactly what is expected of students entering industrial employment.

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THINKING OF OTHERS

The assembly was crowded with students whose ages ranged from 14 to 18. All were listening intently to an interesting talk, interestingly given by the able principal of the school. The door opens and in come several late-comers. Their clattering heels which disturb listeners as well as the speaker, seemingly do not disturb them, for they continue down the aisle until they find a seat.

The idea that they are discourteous to the speaker as well as to everyone in the audience never seems to draw upon them.

The middle-aged visitor, as midde-aged people do, compares present-day manners with those of his youth, but finally dismisses the subject from his mind with the charitable thought "They are young and will learn."

The same visitor, some months later was listening to an address given by a reputable educational authority. The audience was largely composed of school teachers. The speaker was handling his subject in an able manner. Presently four bright-looking young teachers held a hurried whispered consultation and then with one accord, filed out into the aisle and clattered out. Evidently they, too, had not as yet arrived at the age when one has learned to take others into consideration.

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INDUSTRY AND SCHOOLS

Many schools are working without definitely knowing the needs of industry—in preparing boys to go to work. Many times industry cannot absorb trade-school graduates, because they are trained for trades in which there is no dearth of trained workers.

If a boy has pursued a trade course and does not find employment within a reasonable time after the course is completed, the school owes him a moral debt. If it is a question of a temporary depression in an industry, the school cannot, of course, be blamed. If however, it is a question of offering a trade course for which there is not sufficient demand, to the exclusion of one which might have been substituted at no appreciable additional cost of equipment, the school officials have an obligation to meet. It is the responsibility of those in charge of a trade school to offer courses which will place its graduates advantageously.

From another angle, most schools seem to be unaware of the fact that industry does not hire boys by graduating classes in June but individually as industrial conditions warrant. From this it would appear that any time industry needs a boy, if the boy is capable, and wants to take the "job," he should be given employment provided he is beyond the compulsory-attendance age. The time of starting and graduating from a trade course should be *any time*.

This matter of placing graduates—finding openings and the time for placement is one which affects every trade-school program. Until the industries of the community are carefully surveyed, and closely cooperated with, the possible maximum efficiency will not be reached.

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PLANNING THE SCHOOL SHOP

No longer is the school shop housed in dark and dreary basements. Its educational possibilities have been recognized, and an increasing amount of thought and care is being spent upon its planning and its equipment. The wide acceptance of the educative value of shop subjects, and the consequent inclusion of shop courses in the curriculums of all classes of schools from the elementary to the college, has developed a real need for definite information pertaining to the size of rooms required for different types of shop activities, the location of shops to obtain proper natural light, the sources of supplies and equipment, and similar factors.

Lack of this information in the past is the cause of the wide divergence of opinions in everything that enters into the planning of the school shop. It has brought about a great waste of effort, money, and valuable space, and has done a great deal in bringing the industrial arts into disrepute in some quarters.

Superintendents, directors, principals, supervisors, and teachers of shopwork, who have to do with shop planning and the ordering of equipment and supplies, as well as the replacement of old equipment, will, therefore, be pleased to find that *Bruce's Specification Annual* embodies a study which will be of great assistance to them in the solution of their shop problems.

The judicious use of this book will gradually bring about a standard shop layout, and a standard equipment for the different types of schools and will thus do away, on the one hand, with useless waste of money for tools and machinery that are needlessly expensive, and avoid on the other hand, the foolish penury which prompts the purchase of such cheap equipment that it defeats the purpose for which it is bought.

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PREPAREDNESS

Now is the time to review the events of the past school year, and to plan for the coming year. It is true, no doubt, that in the main, the year just now coming to a close was as successful as any. Yet there were some shortcomings. If we were wise we made a note of them when they occurred. But even if we failed to do this, there is yet time. Most of them are in our memory and we can adopt measures to avoid them next year. The plans for these changes, however, must be made now. If we wait until the beginning of the next school year, our good intentions will most likely come to naught, for the time to plan is when the occurrences are still fresh in our memory, and not after the impressions are weakened or even effaced by the distractions of the vacation period.

Let us therefore, review our outline of instruction, our unit instruction sheets, our progress charts, etc., right now, and be prepared to make next year as nearly perfect as it is humanly possible.

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As it stands today, industrial-art education needs many changes. Pedagogical methods must be eliminated if they tend to lose the individual in the group. More attention must be directed to the practical work of carrying out the design produced. We must bring to our students more of the inspiration of the fine arts and in turn familiarize students in these courses with practical problems in the industrial world. Above all, the superficial must be eliminated.

Industrial-art education is not a fad, but an opportunity. It concerns not only our talented young men and women, but our manufacturers, buyers, merchants, salesmen and buying public.—*L. Earle Rowe.*

INSPECTION TRIPS THROUGH INDUSTRIAL ESTABLISHMENTS

Herbert C. Ruckmick, Department of Industrial Arts, Washington State Normal School, Bellingham, Washington

INSPECTION TRIPS have been adopted rather generally by shop teachers everywhere as a part of the course of study in practical-arts work. As a method which assists teaching in shop or classroom, it appears to be an adequate instrument by which first-hand acquaintance of socially important factors can be given. It is agreed to be the purpose of school systems of this country to help point out the relationships of the individual to his social institutions and likewise to show the influence of institutions on the individual.

Industry must be considered as an institution of far-reaching influence, because each person is both consumer and producer. Industry can mold, for good or bad, many other institutions with which it comes in contact.

To make trips to industrial establishments really educative, it appears of primary importance to make them ventures in which the greatest amount of student activity obtains. For this reason, the following suggestions are submitted.

Industrial Assistance

There is a decided tendency at present, to bring industry under closer observation of the layman and of school children. Chambers of commerce make industrial information available and try to stimulate interest in local industrial enterprises. Industrial concerns themselves, attempt to further the education of individuals in connection with manufacturing, with the aim to make the layman a more intelligent consumer. We should know more about the materials of which the goods we buy from day to day, are made; where the materials come from; how their cost compares with that of other materials; the kind of workmanship involved in making the finished article, etc. All of these are evaluations which we have to make as members of society, and perhaps we can make them better if we have had the advantage of inspection trips through some of our modern industrial plants.

How to Organize Visits

The success of a class trip to an industrial plant depends upon well-defined plans and carefully assigned problems before the trip is undertaken. It can be made more meaningful when:

a) The guides know the point of view of students. This means that arrangements for the trip must be made some time in advance, and that an explanation must be given to the plant management of what has gone before in classwork and what the objectives of the visit are.

b) Students are themselves strongly desirous of making a trip of investigation. The desire may be based on certain definite problems or questions which the students are anxious to answer. A workable scheme to arouse real interest in the trip is a question schedule of leading considerations which the teacher has worked out *with the class* and not *for* the class. It is important that this schedule of questions should not be imposed on the class by the teacher, but that the class shall help formulate it in accord with its past experience in the shop. Questionaries will therefore differ for each class.

c) Inspection trips are made in small groups. The noise of machinery usually permits of little instruction on these trips. Then too, mechanical hazards make the management of large groups dangerous. The questionary, when properly organized, places very definite material in the hands of each student. If he has had a part in preparing the questions he is all the more interested in putting up a serious effort to obtain the information. He also gets a concept of a more systematic way of attacking a problem. If the questionary type of procedure is followed, valuable information for later class discussion is preserved, and inspection trips, instead of being mere "picnics" or "excursions," become serious efforts, in which each person bears a responsibility.

Factors Governing Types of Questions

As previously stated, the value of the information gathered during a visit to a manufacturing plant, lies not only in establishing a passing appreciation of certain aspects of the industry, such as—"A cement mill is a very dusty place," or "The lumbering process produces many by-products," but rather in the determination of certain definite facts, with the hope of arriving at appreciable conclusions affecting the individual or society. To help bring out these important conclusions therefore, the sample questions are chosen so that they fall under one or the other of the following classifications:

a) Materials used.

b) Processes involved. This information leads to greater appreciation of the product, and better choices of commodities.

c) Social values. This includes labor questions, and the influences which industry has on the community and on the country.

d) Economic values. This means the relationship of prices of raw material, cost of production, selling price of the commodity, and value of the total products produced in this country. This information leads to an appreciation of the industrial investment in the community.

e) Vocational or educational guidance facts. Under this heading are included an appreciation of the type of training needed. To this end a trade and job analysis of the plant is made, if possible, in order to develop an understanding where certain jobs lead.

The following are samples of questionaries developed in the junior-high-school shop classes at Bellingham, Washington.

A Visit to the Cement Plant

1. What are the materials used in making cement?....
2. Where does each of these materials come from?....
3. What process is used in grinding and mixing these materials? .....
4. What is the capacity of the plant per day?.....
5. What kind of power is used?.....Source?.....
6. Where is the cement marketed?.....
7. How many kilns are in the plant?.....
8. How does the production here compare with the total production for the United States?.....
   (See a commercial geography or a World Almanac.)
9. How much money is invested in sacks?.....
10. How many men are employed?.....
11. How much coal is used?.....
12. Compare the cost of milling the cement with the cost of repairs in machinery .....

An Inspection Trip to a Lumber Mill

1. What are the kinds of lumber used?.....
   a) How much is used a year?.....
   b) Where is it obtained?.....
2. What are the steps by which a log becomes finished lumber?
   a) .....
   b) .....
   c) .....
   d) .....
3. For what is the lumber used?.....
4. What is the market for this lumber?.....
5. How much is the lumber worth per year?.....
6. Approximately how much waste is there?.....
   a) What by-products are made from left-over materials? .....
7. How many men are employed?.....
   a) What different jobs are there?.....
   Average salary?.....
   b) Length of the working day?.....

8. Why are our lumber resources extremely valuable? .....

a) What precautions must we take to save lumber? .....

b) Why do we need reforestation? .....

9. How does Washington compare with the other states in production of lumber? .....
(See World Almanac, 1927.)

10. How does this country compare with other countries in lumber resources? .....How does this section of the country compare with other lumbering sections of the country? .....
(See local chamber of commerce reports, or statistics from various mills.)

OBSERVING OTHERS

George C. Donson, Supervisor of Manual Arts, Washington, Pennsylvania

I think industrial-arts teachers should see and know their neighbors. Every teacher should plan to inspect at least five different school shops each term. No teacher is so poor at teaching that he will not display some good qualities during a day's work, and no teacher is so superior that there is no room for his improvement. It does not matter therefore where you go, you will get some suggestions for the improvement of your work.

These visits also give the industrial-arts teacher a good opportunity to cooperate with the English teachers, for the pupils, after such a shop trip, have something to write and talk about.

Every teacher should be familiar with the industries of his community. Industry and commerce are only too glad to cooperate if you give them a chance. The doors of the shops used to be open and the boys could wander around and see the wagonmaker, the machinist, and the cabinetmaker at work. Now the doors are closed and the signs "For employees only" and "No Admittance" are placed above the doors. It is the duty of the instructor to make it possible for his pupils to see what is going on behind those closed doors.

An instructor of woodwork took his pupils for a trip through a furniture factory. This instructor had always insisted that his boys plane and sandpaper all parts of the stools they were making whether the parts were observed after the stool was assembled or not. The boys noticed, however, that this was not done at the factory, and informed their instructor of that fact. Upon questioning, the foreman of the plant explained that leaving those parts which are not observed in the rough, saves the plant thousands of dollars each year.

CRAFTSMANSHIP SHOWN BY ELM VOCATIONAL SCHOOL, BUFFALO, N. Y. BLACKSMITHING WAS THE FIRST OF THE CRAFTS DONE BY MAN.

PROBLEMS & PROJECTS

This department aims to present a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine-shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration.

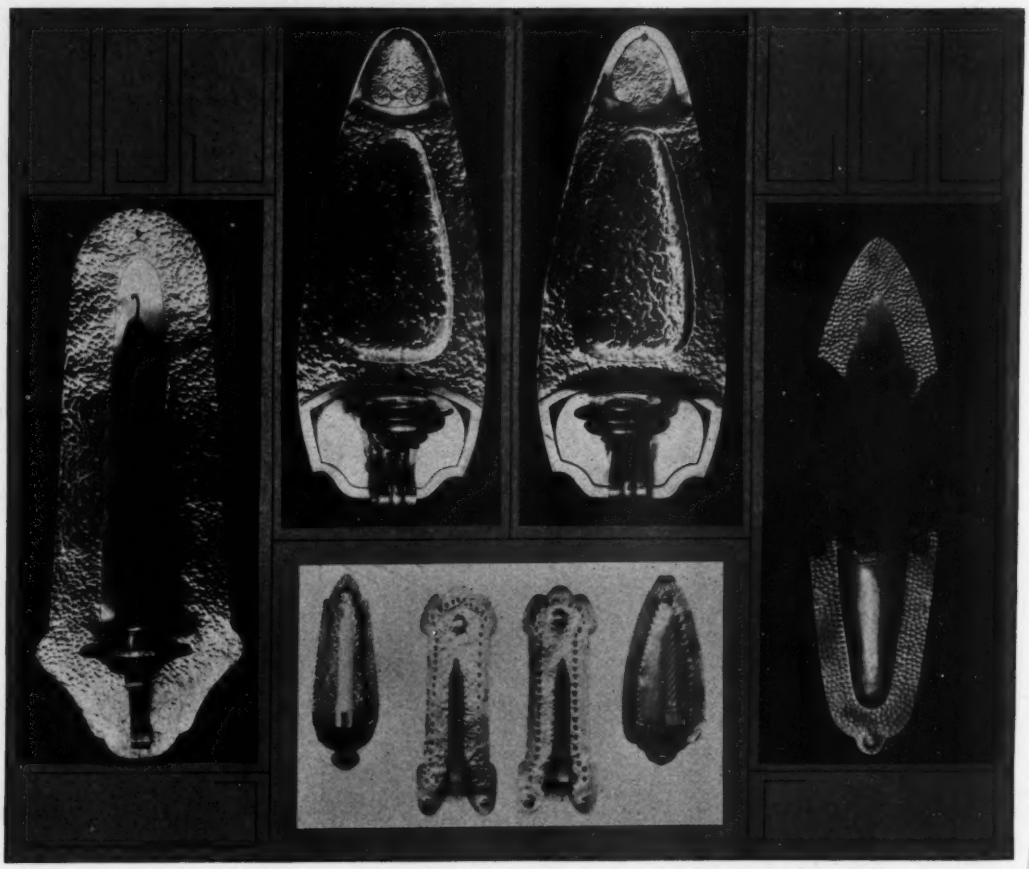
A CONTRACT PLAN FOR MANUAL ARTS

Emerson Wm. Manzer, Wisconsin High School, University of Wisconsin

With the general shop coming into vogue in the field of manual arts, it is quite necessary for the shop instructor to utilize some plan for the motivation of classwork and to aid him in the many pedagogical problems that arise. Experience teaches us that it is quite a task to assist every boy during the regular class period, and it is doubly hard, when that period is a sixty-minute period. As a result of the lack of time to get around, there are occasions when some of the boys are at a loss to know just what they are to do next. Being active youngsters, they soon wander over to their neighbor's bench and here we often find Tom and Dick cooking up a pot of trouble at John's bench. The crack of a flat board is heard and the instructor frantically rushing over to the mischievous boys asks, "Why aren't you boys working?" Only to receive the reply, "Why, we don't know what we should do next!" This is a typical situation in the one-subject class, and when it comes to teaching several subjects at the same time, it becomes imperative to use some sort of teaching aid that will tend to take care of the *"next"* questions. Many form of job sheets, instruction sheets, and lesson sheets have been worked out for manual-arts courses but they take care of only the shop activities; nothing is done to develop the classwork or the academic side of the subject. Leaders in the field of industrial education recognize the importance of more classwork in the shop subjects and it seems almost impossible to do good teaching without regular class assignments.

In order to vitalize the classwork in the shops of the Wisconsin High School at the University of Wisconsin, the contract plan was employed, and from the results obtained, its employment has proved a valuable asset in attaining the aims and objectives of the department. One of the main objectives of the metal-shop course, is *Industrial Information Through Participation and Observation.* The information gained from class participation alone, is not sufficient, however, to say that a good job of teaching has been done. To really accomplish a good job of teaching, it is necessary to supplement the classwork with related information so that the boy's knowledge of industrial procedure will be increased. To this end, shop excursions were arranged for the classes. These were undertaken to local shops, and in several instances, to shops located at Milwaukee and at Rockford to study manufacturing processes. Slides and films secured through the bureau of visual instruction of the University of Wisconsin, and the department of interior, Washington, D.C., proved valuable in attaining the aims set up for the classes. Besides the foregoing, topic reports were written as part of the contract requirements, and during the class recitations they were read and discussed by the group. Intense interest was manifested in all of the conferences proving that subject matter can be taken up in the regular manual-arts course. The success of the plan in this experimental school warrants its introduction into other schools.

In the contract for the wall sconce, the topic for the A Contract is *Development of Modern Lighting.* What does this title suggest? In the first place it suggests a great deal of searching for material; the collecting of pictures of the first electric lights made by the great American inventor, Thomas A. Edison; the gathering of some information relative to the work of the late electrical wizard, Steinmetz; and information of like character. It is self-evident that the contact with stories about these great men, has great significance for the boy who is just beginning to like electricity. It is further evident that



the topic lends itself readily to class discussion, and that it furnishes considerable related industrial information to the class as a whole.

The B Contract is based on the topic, *Candle Making*. Is the boy interested in learning about candle making? Does this study give him industrial information that he can transmit at the evening dinner, or to friends who admire the beautiful candle sconces that may adorn the wall in the cozy living room? Does this topic lend itself toward the achievement of the objective set up for the course?

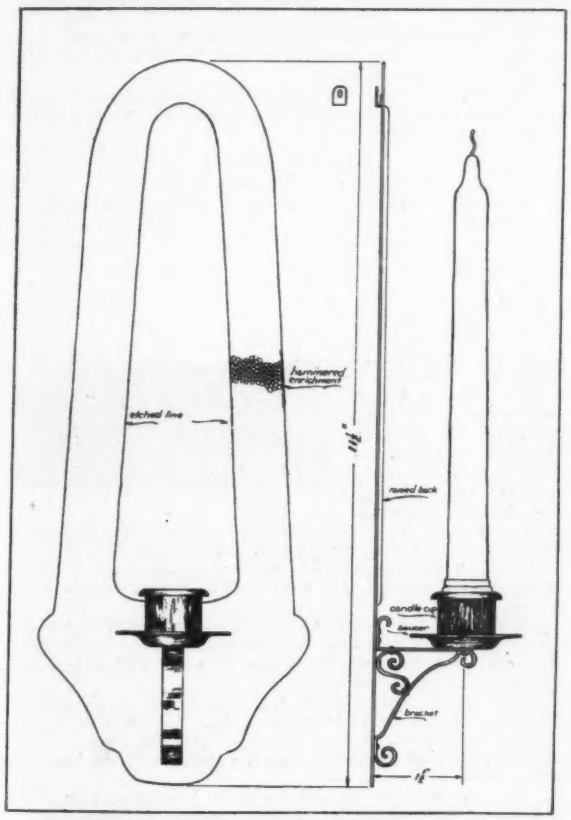
The topic of *Pewter* in the C Contract immediately brings up a mental picture of early colonial days. This topic, supplemented by pictures of pewter ware, will be most interesting to the class. Class participation plus the outside agencies which the instructor makes use of, will make the manual-arts work more dynamic and keep it in the respectful position it has attained.

Sample Contract

Contract Plan for Wall Sconce

A Contract.

1. Make an original design for an electric sconce.
2. Collect 10 pictures of electric sconces. Paste them on a sheet of unruled paper size 8½ by 11 in.
3. Write a paper of 500 words or more on the topic, *Development of Modern Lighting.*
   Trace the steps taken to produce the modern light.



B Contract.

1. Make an original design for a candle sconce.
2. Collect 10 pictures of candle sconces. Paste them on a sheet of unruled paper, size 8½ by 11 in.
3. Write a paper of 300 words or more on the topic, *Candle Making.*
   Supplement your paper with sketches when possible.

C Contract.

1. Use the design shown in the illustration, but make an original design for the bracket.
2. Collect 5 pictures of candle sconces. Paste them on a sheet of unruled paper, size 8½ by 11 in.
3. Write a paper of 200 words or more on the topic, *Pewter.*
   Supplement your paper with pictures of pewter ware.

Note: If you have any special topic that you would prefer to write on, consult your instructor and obtain his permission to take the topic. The topic must have a direct bearing on the problem being made in the contract.

Contract: Wall Sconce.

Specifications.

Primary mass of the sconce should not be more than 4½ in. wide and 14 in. high. Good proportions in the primary mass are essentials to good design.

Use copper, brass, or pewter.

Tools.

Sheet-metal tray; small chasing hammer; hand drill; twist drills, according to rivet diameters; jeweler's saw frame and saws; set of small files.

Part 1. Back

Procedure.

1. Design the primary mass. (Read Ref. 1*, Chap. 2 and 3.)
2. Cut primary mass from heavy drawing paper.
3. Plan contour enrichment of primary mass. (Ref. 1. Chap. 8.)
4. Fold primary mass on center line and cut contour as planned. If the first result does not suit, repeat the steps until a satisfactory result is obtained. Do not be satisfied with the first trial, as the next one might be much better.
5. Present your pattern to the instructor for his criticism.
6. Transfer the pattern to the metal. Trace the contour with a sharp instrument.
7. Cut out the design allowing for file finish.
8. File edges and clean surface with steel wool or pumice stone.
9. Cut pattern for beating down surface. (See illustrations.)
10. Trace pattern on the reverse side of the sconce back. Why is this done?
11. Beat down the surface outline using ball end of chasing hammer. (See Fig. 63, p. 111, Ref. 2.)

Note: The beating-down operation may be done with a rawhide mallet. This tool will leave the surface free from the metal hammer marks that the chasing hammer will leave. (See p. 86, ref. 2. on Annealing Metal.) Make a test on a scrap piece of metal. Remember that pewter has a low melting point.

12. Planish the right side of the sconce back.
13. Clean the surface of the metal. Get an O.K. on the work you have done.
14. Enter the material which has been used on the cost record.

Part 2. Drip Saucer

Procedure:

1. Design the form of the saucer. Do not make it too deep. Get an O.K. on your work.
2. Turn a concave form for the saucer. Use the faceplate method for turning. (See sketch A below and read Ref. 4, pp. 203-207.)
3. Cut two circular discs of metal, making them ⅛ in. larger than the finished diameter of the saucer.
4. Charge the metal on the charge or cost records.
5. Fit the metal disc to wood form.
6. Beat the metal to conform to the hollow or concave form. Use ball end of chasing hammer.
7. Trim the outer edge of the saucer.
8. Get O.K. on the work done.
9. Turn the wood form as per sketch B shown below.
10. Place the saucer back into the form, and hammer the edges of the saucer to fit the form. (See sketch B.)

Part 3. Brackets

Procedure:

1. Design the brackets. (See illustration for suggestion.)

Note: Pewter being much softer than copper or brass, will not support a large candle unless the bracket strips are made wider. Be sure to take this into consideration when your bracket design is being made.

2. Cut brackets from scrap stock if possible.
3. Form them to fit the full-size outlines.
4. Drill holes for the rivets. Use small tinned rivets, or solder.
5. Assemble bracket parts before attaching them to sconce back.
6. Charge material to cost record or shop charge card.
7. Get O.K. on the work done from instructor.

Part 4. Candle Cup

Each pupil is to plan his own method for holding the candle. (Several suggestions are given in the illustrations of sconces shown in this article.

From the outline of the work to be done it is quite easy to see how a plan of this kind will help to keep Tom and Dick at their own benches. Practically all of the *next* questions are taken care of and the work proceeds smoothly, thus giving the instructor more time for critical observation and individual teaching, when it is needed. As a teaching aid, for the general shop, the contract plan has proved itself worth while, and will be worth while to others who will try it in their shops.

*References:
1. Varnum, Industrial-Arts Design.
2. Payne, Art Metalwork.
3. Rose, Copper Work.
4. Griffith, Woodwork for Secondary Schools, pp. 203-207.

TOO MUCH PLAY IN THE STEERING GEAR

Ray F. Kuns, Cincinnati, Ohio

The steering gear is subject to neglect because most drivers know little about it, and because it is in a position where it is more or less difficult to get at it. Figure 1 shows a gear which has seen much service and much neglect. The accumulation of grease and grime is not all from one season. The grease cup on the end of A is almost hidden under the dirt. It was found to be filled with hard, dry, cup grease.

The steering gear should be kept reasonably clean, and it should be lubricated regularly. It may be necessary to fill it with grease but once a season but it ought to be inspected more frequently to make sure that all is well. Two points to be checked up on are indicated in Figure 1 at A and B. The nut holding the pitman arm A in position on the cross shaft of the gear should be inspected now and then to see that it is tight. If this is not done, play will develop at this point and once developed it is hard to remedy. B is the drag link where it fits onto the ball of the pitman arm. Keep this point packed with grease. It should have a boot over it to keep out the dirt. See also that it is properly adjusted to take out any play.

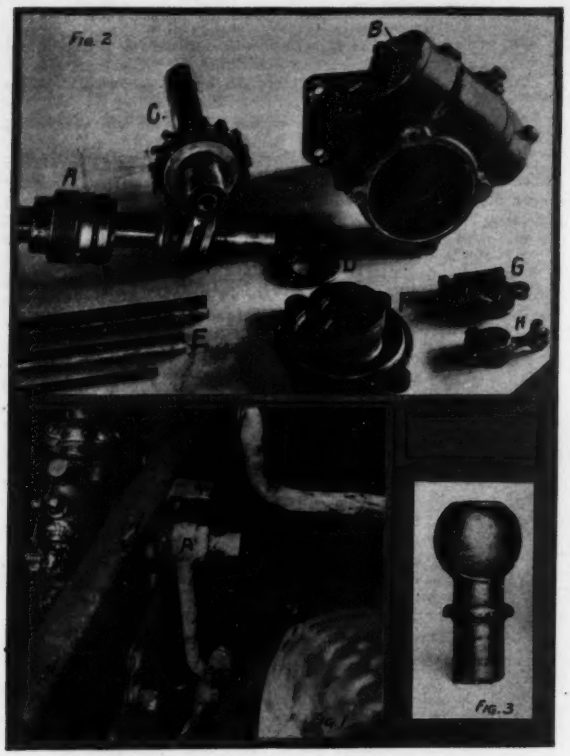


FIG. 1. STEERING GEAR SHOWING EVIDENCES OF NEGLECT.
FIG. 2. STEERING GEAR DISASSEMBLED FOR INSPECTION AND REPAIRS.
FIG. 3. A STEERING GEAR BALL BADLY WORN FROM LACK OF LUBRICANT.

Figure 2 shows a steering gear disassembled. A is an adjusting collar with which to regulate the up and down play of the worm shaft, to the upper end of which is attached the steering wheel. C is the cross shaft and may be designed to come under or over the worm shaft. An eccentric bushing is frequently employed on the shaft at C to swing the gear closer to the worm and eliminate play. D shows the thrust bearings which go on the worm shaft and in the housing. A is screwed into the housing at B. F is the end plate of the housing and is removed to give access to the gear and cross shaft. It has an adjustment on it which allows the end play of the cross shaft C to be taken up. G, H, and E are the tubes and bracket for the spark and throttle controls. When adjusting a steering gear do not try to set it up so that all play is taken out as this will be too tight and damage will occur. Just take it up so as to allow a little play without any binding. Keep a good grade of semi-fluid grease in the housing.

Figure 3 illustrates a ball taken from the front end of a drag-link to steering-knuckle arm joint. Apparently, it had not been greased for a long time. This part had to be replaced, as any adjustment made caused serious binding. Keep these joints packed with cup grease.

HISTORIC LUMBER TURNED INTO GAVELS

H. John Paustian, Walnut Junior High School, Grand Island, Nebraska

When the Nebraska legislature decided that the state needed a new capitol building and made plans to have the old state house wrecked as soon as the new one could be made ready for occupancy, I determined to obtain some of the old oak casing from the supreme court chamber and use it for making souvenir gavels. I succeeded after interviewing Gov. Charles W. Bryan, whose term of office was about to expire; the incoming incumbent, Hon. Adam McMullen; and, in addition, a committee from the legislature and the wrecking contractor.

The accompanying illustration shows one of these gavels which was sent Vice-President Charles G. Dawes for his use as president of the United States Senate.

Vice-President Dawes has expressed his appreciation of the gavel and a Washington correspondent reports that Mr. Dawes prefers it to any others ever given him.

SHELLAC IRONS

D. K. Ingman, Douglas, Arizona

In finishing cedar chests it is usually necessary to fill checks in the knots and other small places where too much scraping would detract from the appearance of the surface. This filling-in can be done very readily with stick shellac. In order to imbed the shellac in the checks so it will not come out with the final scraping and sanding, the writer makes use of the shellac irons which are shown in the accompanying illustration.

Two irons should be made so that one may be heating while the other is in use. From a bar of rolled copper ⅜ by ⅜ in., cut pieces 4½ in. long. Heat to a cherry red and punch a ¼-in. hole ½ in. from the end. Through this hole put a piece of ¼-in. mild steel, 18 in. long and forge it flush with the faces of the copper. Then twist the ends of the rod and draw them out to a tang for the handle. The other end of the copper is marked about half way through with a fuller and shaped as shown in the picture.

Ferrules for the handles can be made from sections of gas pipe. They should be fitted to the dead-center end of the handle before the work is removed from the lathe. With the lathe at low speed they may then be dressed with a file.

The tool is used in much the same manner as the ordinary soldering iron, the shellac being the solder. The point of the iron enables the workman to force the shellac into the checks, and the rounded surface of the back spreads it smoothly over the larger and more shallow depressions.

The iron must not be used too hot or it will scorch the shellac and destroy the color that is intended to match the natural cedar.

Stick shellac of proper color may be used in the same manner to conveniently fill nail holes in close-grained woods where paste wood filler is not applied to the whole surface.

WALL SHELF

C. Anthony Van Kammen, Harrison Park School
Grand Rapids, Michigan

Quite up to the fashion at the present time, and useful as well, is the wall shelf offered in this article. The author looking for a small problem that would present an opportunity for contour enrichment, to use a minimum of stock and answer a need, observed a small shelf in a department store. The material in the problem amounted to less than a foot of lumber. The workmanship was not as good as many of the boys proved capable of doing in the 6th and 7th grades, yet the price was $2.50. In the school shop, a working sketch was presented at the blackboard. (See Fig. 1, A and B.) In addition, the author had a finished model for the boys to observe and handle. Note that the side view is drawn superimposed upon the front view, and that for this reason only half of the upper and lower back pieces are drawn. The reason for superimposing the views is that the draw-

ing paper used is only 12 in. wide. Further, it seems to add speed as it is not necessary to project lines for locating parts on the drawing.

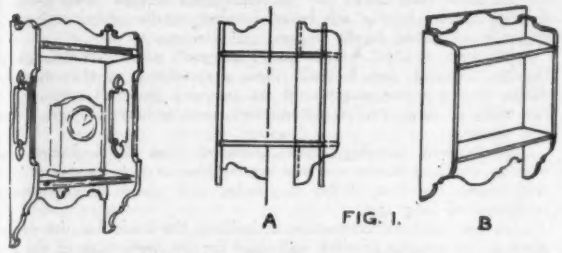


FIG. 1.

All drawings made by the pupils are full size and without dimensions. The latter are taken from the stock bill which must accompany each drawing. To avoid confusion, the side view is outlined in red pencil after the drawing is completed. As each boy is required to design his own contours, it often happens that the backs are made in different widths. Most stock bills will be different so all must be checked up with the drawing. Every boy must know his drawing before he begins work in wood, therefore questions are asked about the drawing, such as, "Where can I find the length of the shelf?" If the boy points out only one place he is asked "Where else is this information found?" etc.

FIG. 2. EXAMPLES OF FAULTY CONTOURS WITH CORRECTIONS.

With reference to designing the contours, some examples are given at the blackboard, good and bad. These are discussed and the reasons given for their good or bad qualities, such as in Figure 2, A, B, C, D, and E. In Figure 2A the curve is not suitable as there is not enough variety in the measure *a b*, and *b c*. The same may be said for the two curves in Figure 2B though at *b* there is a point of contrast. The illustration at Figure 2C shows a very rhythmic line but the measures *a d*, *d e*, *e c* are almost alike. This is improved in the small view by making the center curve dominant and putting in fillets at *d* and *e*. Figures 2D and D′, it is apparent, are hopeless failures. They are the efforts of a boy with no appreciation of beauty of form and who lacks drawing talent. There is no definite direction of line nor is there system of measure or subordination in his work. He has the idea that an abundance of lines and curves rather than simplicity will bring about the desired effect. Point *a* Figure 2D is structurally weak as wood so cut is thin at the edge and may be easily injured. Faulty lines are also shown in Figures 2D and 2D′, at the point *b*. Avoid making curved lines meeting other lines at other than a tangent or a perpendicular position. See Figure E, *a* and *b*, and corrections at Figure 2E′, *a* and *b*. Do not use the compass circle as in Figure 2E. Free-hand curves are much more desirable because they have variety in their everchanging direction of line, as is shown by Figure 2E′. Notice the continuity of line, the rhythmic movement of one curve into the next, and the points of contrast. After a discussion similar to the above the class is started in their work.

The 6th grade makes a wall shelf with a solid back cut from beaver board, and without pierced ends. A slightly larger shelf having pierced ends and with two pieces for the back is used in the 7th grade. Stock bills for both sizes are given.

STOCK BILL
6th Grade

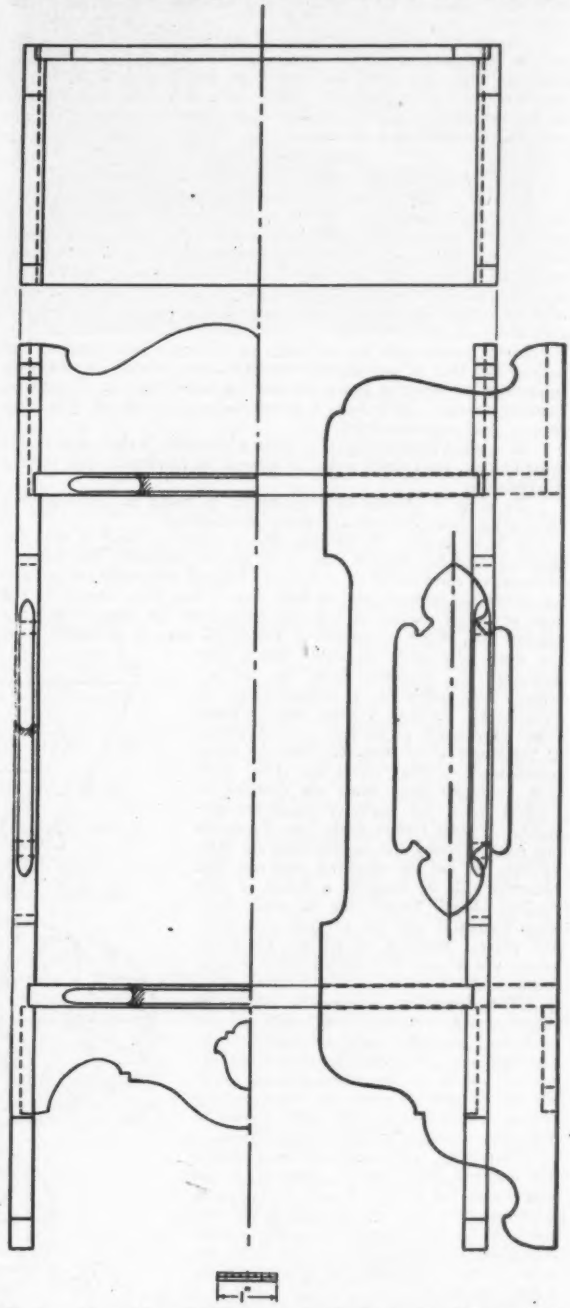
2 pc.	11x4 x⅜	Sides, Basswood.
2 pc.	7x3 13/16 x⅜	Shelves, Basswood.
1 pc.	11x7⅛x 5/16	Back, Beaver Board.

STOCK BILL
7th Grade

2 pc.	15 x4 x⅜	Sides, Basswood.
1 pc.	7½x3¾x⅜	Top Shelf, Basswood.
1 pc.	7½x4 x⅜	Lower Shelf, Basswood.
1 pc.	7⅛x2⅞x¼	Top Back, Basswood.
1 pc.	7⅛x2⅞x¼	Lower Back, Basswood.

The 7th-grade problem was so designed that it not only is a good woodworking project, but also offers much as a mechanical-drawing problem. The upper back extends down behind the upper shelf. The lower shelf extends through to the back with the lower back piece against the under side of the shelf. Both upper and lower backs are rabbetted into the sides 5/16 in. or half the thickness of the sides, while the shelves are inserted into a dado only ⅛ in. deep.

The junior-high-school problem is made with the use of woodworking machinery. All pieces are reduced to size and then hand planed to remove all mill marks. Allowing for the band-saw kerf, made while removing designated section from the sides, they are made



4 5/16 in. wide. After the ends are pieced, the saw kerf is carefully glued up. Use two 8-in. hand screws. Place a strip of paper on each side of the kerf, and keeping the hand-screw jaws parallel, clamp the board lightly flatwise over the kerf. With the other clamp pull the kerf closely together. When dry, the pieces are sawed to the exact width of 4 in. The dadoes for the shelves are cut on the saw. The four rabbetted sections to receive the backs are done by hand. Carve the decorative groove in the front of the shelves and sides.

All of the pieces are lacquered and rubbed before they are glued together. Avoid getting color on the ends of the shelves or in the dadoes. If properly glued together no nails will be required except from the rear through the upper and lower back pieces into the

sides and from the upper back into the upper shelf. If for any reason it is necessary to nail through the sides and into the shelves, the nail holes may be plugged with a filler made from thick shellac, lacquer of the right color and powdered chalk. The lacquer, besides giving color to the filler, aids in the drying process. A drop of lacquer over the filled nail hole, a little rubbing, and the job is ready for the gilt paint. Any gilt paint placed where it is not wanted may be quickly wiped off, or if dried on may be easily removed by a little rubbing.

The shelf is hung up by means of two small picture hooks which may be purchased in the ten cent stores. The hook end is straightened out and two small nail holes are punched through with a sharpened nail or they may be drilled. Fasten a hook on each side at the top with ⅜-in. No. 20 box nails. Pins for hanging on the wall are furnished with the hooks.

CHIP CARVING

Mary Louise Speed, Louisville, Kentucky

Having a chip on one's shoulder is an old-time, homely way of expressing an unhappy state of mind. It generally denoted that the one having the chip felt that every man's hand was raised against him. But having many chips, tiny bird-shaped ones, all about one, on the table, lap, caught in the folds and creases of one's clothes, and on the floor, has often proved conducive to a happy, contented state of mind. The chip maker is too busy to have time for vain imaginings about his woes.

Many people sigh for a hobby or a simple new pastime, but lacking the time or opportunity for instruction, money for elaborate equipment, or inventive genius for making something out of nothing, continue to sigh. May such a person become acquainted with chip carving, and cease his sighs.

In schools, private classes, or clubs where time is short and equipment lacking, yet a short period is allowed for handwork, chip carving is applicable.

To many a shut-in or convalescent in home or hospital, chip carving has brought hours of happy employment.

It is so simple. A penknife and a block of wood, a coin for circles, a card for straight lines, is all that is required. No home is too poor, no rural school too remote, no hospital equipment too meager, no person too unresourceful to find these. Two 6-in. squares of red gum or yellow poplar, of any thickness, from the scrap heap of a planing mill, two 5-in. squares of galvanized iron ⅛ in. thick, from the scrap heap of a tin shop (where they will bore the necessary holes for the six screws) will suffice for a beautiful pair of book ends. So may a jewel box be made from cigar boxes to be had for the asking at the corner drug store, or from the many pretty wooden boxes which one never quite likes to throw away when the contents of candied fruits, figs, dates or candy are consumed. Picture frames made from flat molding left unstained and unvarnished are inexpensive, yet can be converted into rare and beautiful gifts by applying a design of chip carving. Small frames can be made from scrap boards if one has a chisel, saw, drill, and plane. Simplest of all are the paper knives which may be whittled from a stray stick.

The discerning person will locate the yellow poplar, basswood, soft cedar of the kind used in cigar boxes, red gum and an occasional piece of satiny, fine-grained mahogany or walnut in the scrap pile, for these are the varieties of wood best suited to chip carving. Any planing mill will be glad to give away a load to get it off the grounds.

The large, well equipped shops should not overlook chip carving, deeming it too insignificant for notice. Simple though it is, a boy will have more zest for making the shop article if he can decorate it, make it more individual, differentiate it a little from the other fellows', particularly if it is a gift designed for home.

With little or no equipment the following can be made: Paper knives; bread boards; boxes for cigars, cigarets, jewels, candy, gloves, handkerchiefs, writing material, pencils, stamps, or what not; picture frames; and book ends.

With more equipment, the following articles can be made more beautiful by the application of a chip-carved design: The legs of caned or tapestry-covered footstools, legs and drop boards of small tables, mirror frames, chests, sides of bookracks, sewing stands, frames of fire screens, backs of large portfolios, and bellows.

"Peasant Art in Russia," edited by Charles Hohne and published by the Studio, has illustrations of many articles showing chip-carved objects. The peasants in the long winter evenings in the northern forests must have had hours of amusement chipping the work-a-day utensils about their homes for the illustrations include carved wooden distaffs, laundry beetles, salt boxes, benches, candle tables, cupboards, ginger-bread molds, bowls, sledges, and carriages.

"Peasant Art in Austria and Hungary" and "Peasant Art in Sweden, Lapland, and Iceland" show a sprinkling of the same industry during leisure moments in the cow and goat bell collars, seats for milking stools, pestles and mortars, mangle boards, spoon racks, and spoons.

Illustrations of chip-carved doorways from Transylvania and wooden scutching knives and weaving implements give the present-day chip-carving novice a feeling of kinship with those far-away fellow craftsmen of long ago.

A few minutes' instruction in holding the knife for the proper slant, a few samples of work well done for the inspiration of the student, a few scraps of wood devoted to practice work, then give the boy a pattern and he can carve his object without further supervision. After he has carved the parts for his shop project he will construct it with infinitely more care for it is no longer a piece of wood which can be easily replaced, but it is a thing of his own creation.

While chip carving can be done with any sharp pen or pocket knife, there is a special knife designed for this particular work. Sometimes those made locally by the blacksmith out of a finely tempered saw blade are more acceptable than those bought. The sharp edge which is at the end of the knife, not at the side (see Fig. 1), must not bear a shank but must have a gradual slope.

Making the Chip-Carving Designs

No genius nor ability to draw is needed for making chip-carving designs, for they are simply combinations of triangles, squares, and circles. The accompanying designs may be used in an infinite number of combinations. Compare these with figures 10 and 11 which show some of the finished articles. Take a piece of paper the size and shape of the surface to be decorated. It is always well to have a margin on the object. After deciding what width margin you will have, a border to inclose your design must be measured off. The border is secondary, so must occupy a small fraction of the space. Now the space left inside is to be decorated. The design will be governed by the size of the space. It may be a basket of flowers or it may be simply two circles linked together, as shown in Figure 2. It may be a large circle elaborated upon as in the book ends in Figure 10, or it may be an elaborate combination of circles and ovals and fan-shaped figures as in the large box shown in Figure 11. If one sets to work with a given space the size to be decorated, and with a compass to draw the circles, beginning at the center of the space, he

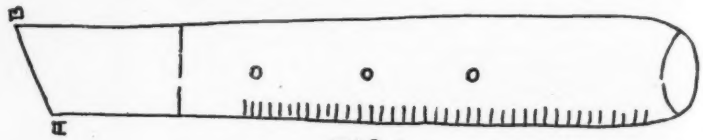


FIG. 1

CHIP CARVING KNIFE. A-B IS THE SHARP EDGE.

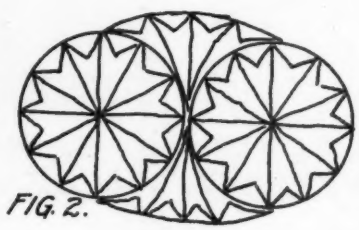


FIG. 2.

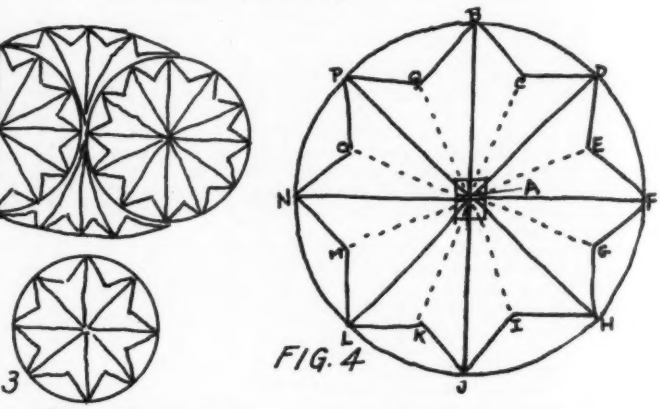


FIG. 4

FIG. 3

FIG. 5

FIG. 6

will find after playing a little with compass and ruler, that many ideas for decoration will come. In fact, the ideas will multiply so quickly from nothing at all that the chief concern will be which to select from the many combinations possible.

After the center design is made it may be extended to fill the space by addition of circles or semicircles. Then the border may be chosen, elaborate if the space is wide, or simple, if the space is narrow. It is well to draw a part of your design on a scrap of wood and cut it out to be sure you know which incisions you wish straight and which slanting, for that decides the light and shadow in your design, also the shape of your units. Entirely different effects may be got with the same designs simply by making a slanting cut where on the previous object you have made a straight one.

After your design is made thumb-tack it down to your object over carbon paper and trace it on the object. Keep your pencil sharp so full definite lines will show on the wood. Of course the object must be sandpapered clean and smooth before applying the design. If you wish to use the same pattern on several objects it is not necessary to redraw your design, should it become torn. Tack a piece of paper over the carved work and carefully take the imprint of the carving with a soft-lead pencil as you used to get the imprint of the Indian's head off a penny when you were a child.

Cutting and Finishing a Chip-Carved Project

The beginner should cut each unit on a scrap of wood before attempting the whole on the object to be finished. It would be well to try the following exercises first, in order to learn to hold the knife easily and to cut cleanly. Exercise I. Draw a circle 1 in. in diameter and divide into segments as shown in Figure 3. Figure 4 shows the design enlarged and lettered to facilitate explanation. Put the point of your knife on C and cut straight into the wood from C to B, then cut from C to D. Now put the point on E. Cut from E to D. Next cut from E to F. Next cut from G to F, next from G to H, and so on, putting the point of the knife at I, K, M, O, and O, so that you cut from I to H, from I to J, from K to J, from K to L, etc., with a straight cut perpendicularly into the wood. Now make a perpendicular cut from C to A having the point of the knife at C, from E to A with point at E and so on around from G to A, I to A, K to A, M to A, etc. Now with the heel of the knife at D and the knife held slanting cut out a chip D, C, A, then with the heel of the knife at B cut out the slanting chip B, C, A, so on around. You will then have ridges at B A, D A, F A, etc., and valleys at C A, E A, G A, I A, etc. While B C D, D E F, F G H, etc., will be triangles left in.

Practice will show how deep to cut and at what slant to hold the knife.

Exercise 2 is shown in Figure 5. Put the point of the knife at B cutting first to A, then to C, then to 1, then to 2, with straight perpendicular cuts. Then with the point of the knife at C cut slantingly, with the back edge of the knife along C B, till the blade slips down with the sharp edge at B A. You will cut out chip C B A. Continue in this manner and you will have little squares of wood, the four sides of which you may nick to resemble little flowers.

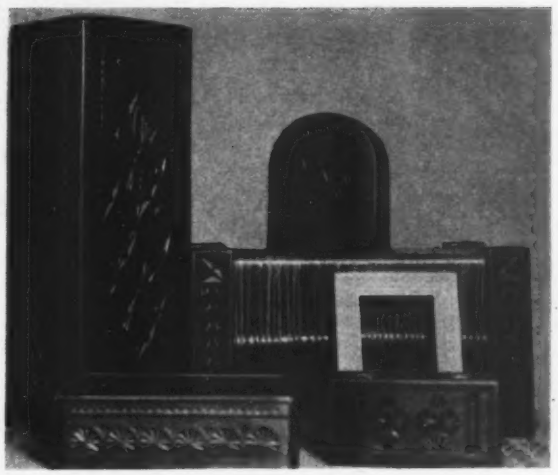


FIG. 10.

Exercise 3 is a simple effective border. (See Fig. 6.) Cut a straight line from A to B and from X to Y about ⅛ in. deep. With the point of the knife make a perpendicular cut from A B, and from X Y to the bottom of the V, then cut slanting from the slant lines so that little chips the shape of the shaded part of the exercise come out on the point of the knife and the rectangular forms are left standing.

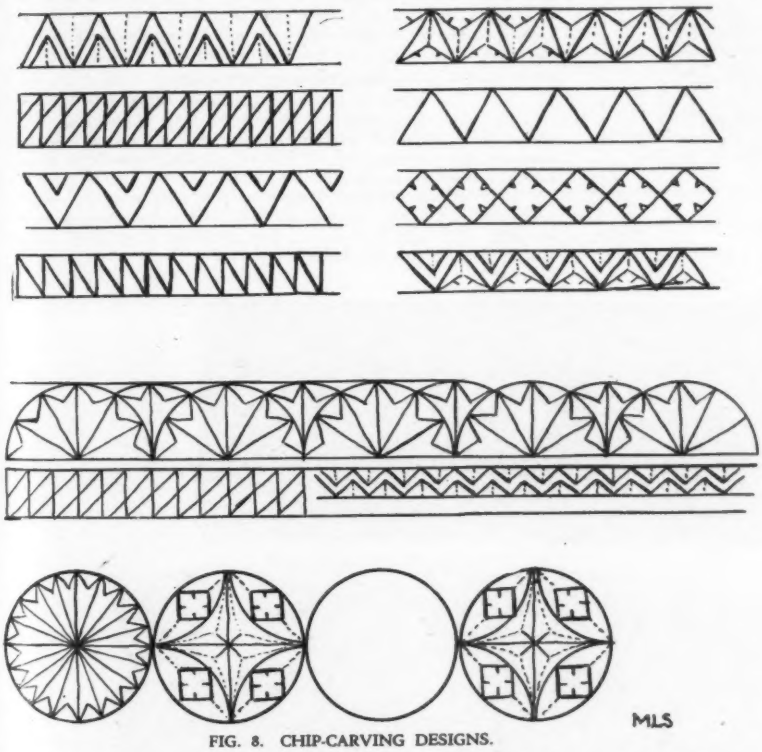


FIG. 8. CHIP-CARVING DESIGNS.

In perfect carving all ridges should be sharp and definite. The slopes should be smooth and meet in a sharp valley or on a clean-cut ridge. Sandpaper must not touch the finished carving, as it destroys the sharp edges. Yellow poplar is an excellent wood to learn on and the finished article looks well if it is stained and polished. But articles made of red gum, cedar, bass, walnut and mahogany are much handsomer if they are left natural, and merely waxed. Johnson's floor wax or a cream made of turpentine and beeswax are both good. Rub the wax in with a small brush being careful not to clog the small cuts. Let stand for one hour and polish vigorously with a woolen cloth. If a high gloss is desired, apply a second coat of wax after the first polishing and polish again.

A Pair of Chip-Carved Book Ends

The book ends shown in Figure 9 and 10, are herewith described. They may be made of gum, walnut, mahogany, or yellow poplar. Practice chipping on a piece of scrap material first.

Material:

2 pc. 1x5x6 uprights
2 pc. 4x4 galvanized iron, ⅛ in. thick
2 pc. 4½x5 felt (green or tan)
6 ¾-in. No. 6 f.h.b. screws
Liquid glue
No. 0 sandpaper
Floor wax or a cream prepared from a mixture of turpentine and beeswax
(Wood stain is desired)
Carbon paper and tracing paper

Equipment:

Coping saw
Wood rasp
Screw driver
File
⅛-in. metal drill
Countersink and brace
Scissors
½-in. wood chisel
Small brush for stain
Castoff tooth brush for wax
Woolen cloth for polishing
Ruler

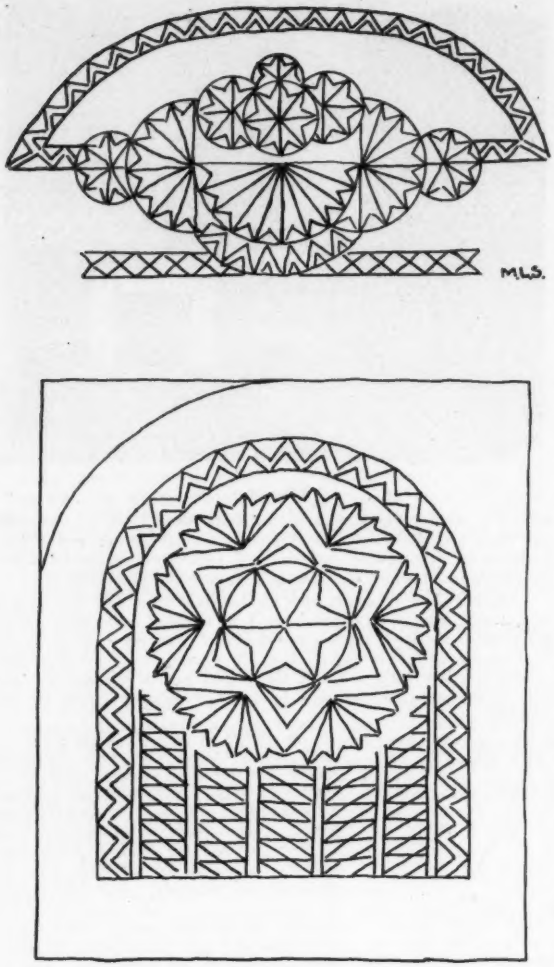


FIG. 9. CHIP CARVING DESIGN FOR BOOK END.

Pencil
Pair of dividers

Procedure:

Sandpaper the two blocks of wood.

Trace your design, (see Figs. 8 and 9) on a piece of white tracing paper.

Thumb-tack to the block over a piece of carbon paper and trace the design on, using compass or dividers to insure the circles being true.

Place thumb tack so that there will be no holes left after the carving is done.

Carve, keeping all ridges sharp and valleys definite.

Cut out a space on the bottom of the blocks ⅛ in. deep ¼ in. from the front and ½ in from each side. Saw off the corners at the top and file and sandpaper smooth.

Round off two corners of each of the 4-in. squares of iron and clean off all grease.

Drill and countersink three evenly spaced holes for the screws about ¼ in. from the end opposite to the rounded corners.

Fit the iron piece into the space at the bottom of the block and screw into place.

If the article is stained, let the stain dry at least half a day after it is applied; then wax.

Glue the felt on the bottom with liquid glue and trim it to fit the iron base.

If metal-working equipment is not at hand, the metal pieces may be ordered from a tinner rounded and with the screw holes drilled and countersunk.

A MACHINE-SHOP KINK

George C. Donson, Washington, Pa.

For some time we had much difficulty in our machine-shop instruction to get the boys to understand how to grind cutting tools. At first we used pieces of soft steel, the same size as the tool bit, for the students to practice tool grinding, but this did not prove satisfactory. Then too, this method was very hard on the emery wheel because they required dressing continually.

Now we explain to the student how a tool bit should be ground, and then he is given a piece of softwood of the same size as the tool bit. This he is required to whittle with a jackknife or a sloyd knife until it has the shape of the desired tool bit. If he spoils a piece, it is much cheaper than steel, and he quickly learns to realize just what is meant by rake and clearance on cutting tools.

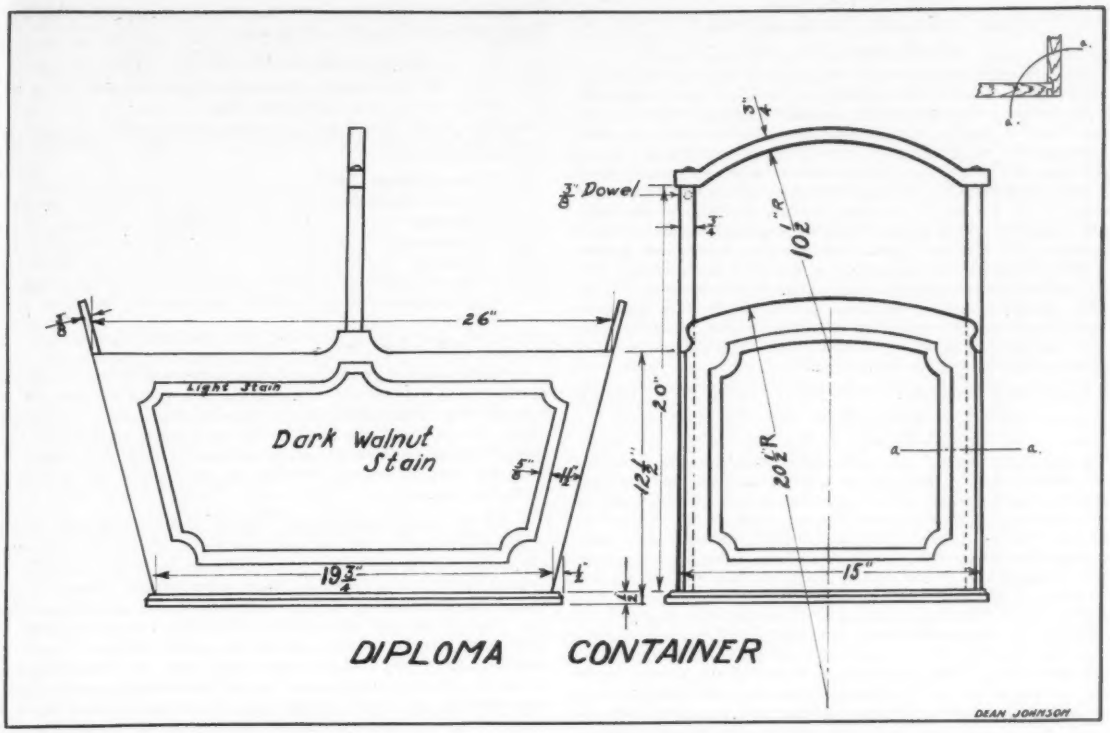
DIPLOMA CONTAINER

Dean E. Johnson, Gardner, Mass.

This diploma container is to take the place of the usual paper-decorated basket which looks rather out of place at the graduation exercises, and the container, if finished properly, is more in keeping with the other surroundings.

It is necessary to have it made of very light material. We use white pine and finish it in walnut which gives a fine imitation as well as being very light in weight. The container is designed for the average size diploma and holds about 225.

Fig. 11.

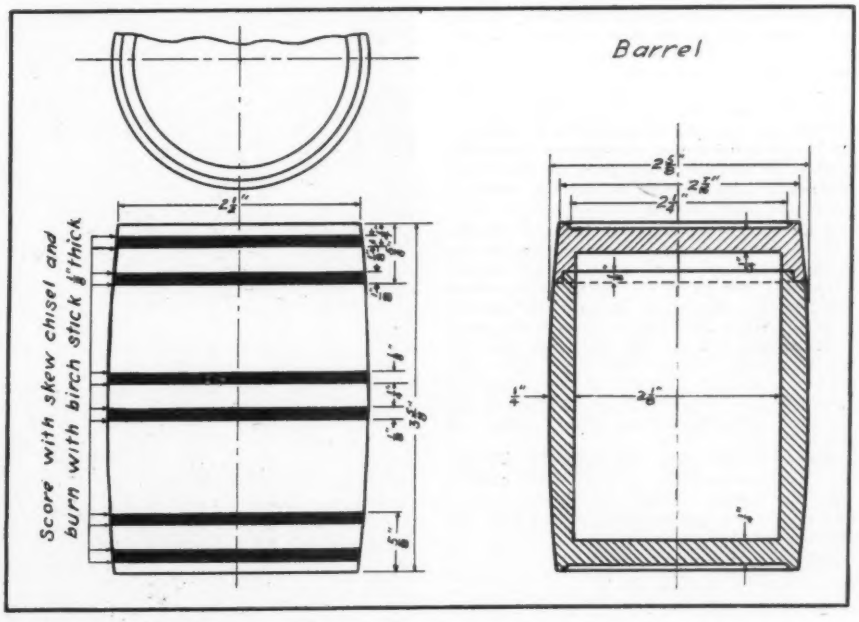


BARREL

Geo. E. Myers, South Junior High School, Everett, Wash.

Walnut stock may be used for this project. A piece 3 by 3 by 6½ in. is required. Ordinary lathe tools, including a cylindrical chuck, will be needed.

1. Place the stock between centers.
2. Turn in chuck to driving fit, for a distance of about 1 in., leaving square shoulders.
3. Drive into chuck and place on lathe.
4. Rough-cut full length of piece.
5. Square end and bore out lid ⅜ in. deep.
6. Form joint.
7. Sand inside of lid, keeping joint true.
8. Apply finish as desired.
9. Cut off lid.
10. Bore out inside of barrel.
11. Form joint to fit lid tightly.
12. Apply finish to inside of barrel.
13. Chuck lid on barrel and complete all outside cuts except cutting off.
14. Lay off hoops and score with skew chisel.



15. Burn hoops with a birch stick.
16. Make fit of joint perfect.
17. Apply finish.
18. Cut off barrel and turn chuck on stub.
19. Place open end on chuck and complete bottom of barrel.
20. Apply finish to bottom.

TRELLIS DESIGNS

Jos. J. Lukowitz, Milwaukee, Wis.

(See Supplement No. 98)

The trellis offers an opportunity to get rid of some of the accumulation of narrow stock which gathers in the school shop. A trellis is a very effective and inexpensive method of adding beauty to the plainest house or garden. Its judicious use will relieve the monotony or bareness of a brick chimney or of a blank wall space. As an embellishment for brick porch piers, whether used singly or in pairs, they are exceedingly effective, especially when painted white to form a contrast with the brick. Against a white background the trellis may be stained brown or green. However, when used against a white background they may be painted white if they are set out two or three inches from the background so as to cast a nice shadow. The shadow of latticework against a light surface is very effective.

Rip enough strips and lay them out on the floor to determine the size and spacing best suited for your requirements. Cut the strips to exact lengths and prime them before assembly. Exterior work of this kind should have three coats of paint.

AN ELECTRIC SEWING MACHINE CONSOLE TABLE

Floyd J. Smith, Miles City, Mont.

(See Supplement No. 99)

People often admire the compactness and convenience of an electric sewing machine attached to a nicely designed and carefully constructed console table, and are heard to remark "I wish that my old machine was an electric in a fine cabinet like that." They have noted that the new electrics are made differently than the earlier foot-power machines, and this leads them to fear that the old models cannot be transferred to the console tables. It can be done however, and while it is no small task, the final result is well worth the time and labor. With the suggestions given herewith, there should be no real difficulty for advanced students of shopwork to "put over" the job.

All the machines I have ever seen have been so built that with the proper style of drop-head hinges, the rear of the casting can be drilled and tapped out for a machine setscrew that will clamp down on the shaft of the drop-head hinge, enabling you to safely drop the machine head out of sight when it is not in use. These drop-head hinges can be taken from a cabinet of an early foot-power model, or can be obtained from the factory that built your machine casting. The drop-leaf hinges are plain, sturdy, broad-leaf hinges which can be purchased at any hardware store in the country.

The console design described in this article has been popular here because it is both neat and strong. The legs are turned in two sections, then glued together. The lower end rails and the stretcher are strong, and yet not too bulky to be in the way of the operator when at work at the machine.

Just behind the two front doors, which swing out of the way of the operator, are two small compartments for extra bobbins, needles, and machine attachments. These doors, when closed, are held in place by small friction catches. The machine top is attached to the table by means of wood screws through strong, sturdy screw eyes fastened to the inside surface of the upper end rails, front rail and back. It is on the under surface of this machine top that regular black-metal buttons are arranged so as to securely hold the drop leaf and the machine in position when the operator is at work. No definite position of these buttons will be given for the reason that different shaped castings require a different shape of opening, and, consequently, a different shape of drop leaf.

The most striking departure from the usual design of consoles is in the construction of the actual top. Console manufacturers usually have the top in the form of double leaves, hinged at each end of the machine top and meeting at the center. This console is arranged for a one-piece job, hinged at the back and opening directly back of the table. When long lengths of cloth are sewed together lengthwise, the material will not fall down over the back edge of the machine and finally drop on the floor. There are advantages and disadvantages in both methods of construction. It seems that all the good points of both cannot be incorporated into one. A pair of black-metal folding brackets are used to support the top when the machine is in use.

My final suggestion to builders, who will undertake this job, is to take nothing for granted when fitting the base of the machine casting into place upon the wooden machine top. Sewing-machine castings are not always straight and true, so to get a neat, tight job, the builder must proceed slowly and cautiously.

TOOLMAKER'S CLAMP

Arthur F. Ahr, Buffalo, N. Y.

(See Supplement No. 100)

Clamps are very handy, especially in layout work and drilling operations where accuracy is desired. The toolmaker's clamp is a popular type and its construction makes it a valuable educational project. It makes an interesting problem, and is a useful tool.

The clamp is made from machine steel throughout. The block and jaws are casehardened and may be mottled or blued, if desired. The screw may be given a light case, or it may be used unhardened. These clamps are usually made in pairs.

TOOL CHECKING MADE EASY

W. B. Walsh, Burnham High School
Sylvania, Ohio

Each of the 24 benches in the writer's shop is equipped with the following tools:

½-in. Wood chisel
1-in. Wood chisel
Backsaw
Hammer
Mallet
Bench brush
Try-square
Marking gauge
24-in. Maple rule

Nearly all of these are placed in a rack which fastens to the back of the bench. However, it was quite a problem to have all the tools in their proper places at the close of each period. Even numbering the tools and the benches did not solve the problem as considerable time was lost in trying to locate a misplaced tool. The following system has been in use for over a year and has been found to be very successful.

All the tools belonging to a bench were painted with a 1-in. stripe of the same color or a combination of two colors, each stripe being about 1 in. wide. No attempt at color harmony was made and as soon as the colors white, red, blue, green, orange, yellow, old rose, etc., were exhausted, we used combinations of red and orange, white and green, yellow and green, old rose and blue, orange and blue, etc. Since it is that part of the tool which extends above the bench top that is painted with one or more of the colors that have been mentioned, it is a very simple matter at the close of the period to glance over the shop and see if all the tools at each bench are of the same color. Any misplaced tool may be easily noted, also its proper bench may quickly be found.

The conspicuous colors also prevent a pupil borrowing his neighbor's recently sharpened chisel. Duco was used due to its quick drying qualities.

One of the ancient looms still in use in factories in Tiflis. Near-East Relief has industrial schools in Tiflis where boys and girls are taught trades and crafts that fit them for self-support. When they have finished the course they receive a certificate and are received into the union of their trade. The schools teach weaving, carpentry, metal work, bookbinding, sewing, etc.

ASSOCIATION AND CONVENTION ACTIVITIES

THE NEW YORK CITY SCHOOL-CRAFTS CLUB MEETS

The annual banquet of the School-Crafts Club of New York was held on Saturday, May 19, at the Geneva Restaurant, 143 West 44th Street, New York City. At 6:30 p.m., 38 members sat down to the banquet. Between the courses those present were entertained with community songs and solos by Mr. and Mrs. Howard Wade Kimsey.

After the dinner, a short business meeting was held. Mr. Francis R. North, principal of the East Side High School of Patterson, N. J., was the speaker of the evening. His topic, "The Traditional and the New Point of View of Manual Arts," was interesting and instructive. He stated that one's vocation or profession was accidental. Educationally, we are laboring under accidents. Most of the education of today is confined in buildings, which is a mistake according to Mr. North.

The Greeks and Teutons did not confine their education to the inside of buildings but used the great out-of-doors; yet the arts and sciences of the middle ages were in some respects greater than those of today. He believes that the boy scout movement is a response to a need that the schools of today do not meet. The fact that we meet the students but four or five years is a handicap.

Mr. North pointed out that man is differentiated from other animals by the fact that he has developed a thumb. He is known as the "fire-making animal." His intellect has developed through the use of his hands; thus manual training came first, gradually developing into the modern academic education that we have today.

Specialization is a mistake in the elementary grades. In attempting to enrich the curriculum the schools have overreached the mark, some having as many as 22 subjects in the eighth grade. It is a mistake to expect a boy of 12, or even 16 years of age, to choose the vocation that he will follow at 30.

President Elliot of Harvard was one of the first to favor pictorial art and some form of manual training. Mr. North believes that manual training should be one of the fundamentals in the school of today and he has arranged his curricula so that the students may receive at least one period of such work each week.

It is customary at the annual banquet of the club to hear from all the past presidents. Letters were received and read from Dr. Arthur Dean, Mr. William Noyes, Mr. Walter Haines, Mr. Fred Reagle, Mr. Phillip Wagner, Mr. Martin Corcoran, Mr. Morris Greenberg, and Dr. E. B. Kent.

Mr. A. W. Garritt, Mr. Richard Beyer, Mr. Edwin Judd, Mr. Fred Arnold, and Mr. Thomas Darling were present and gave short talks.

Souvenirs from Henry Wilhelm Co., American Type Founders Co., and Margaret McAdory were distributed. A handsome ratchet brace from the Stanley Company was given to the holder of the lucky number.

The meeting adjourned at 10:50 p.m.

—*Harry S. Fletcher*

THE EASTERN ARTS CONVENTION AT HARTFORD

Arthur F. Hopper

The nineteenth annual convention of the Eastern Arts Association was held, April 18 to 21, at Hartford, Conn. The convention was formally opened with an unusually large group of delegates from the Eastern states gathered in the auditorium of the Hartford high school. President Theodore M. Dillaway, director of art in the Philadelphia schools, presided. An address of welcome was made by Dr. A. B. Meredith, state commissioner of education for the state of Connecticut.

Ernest W. Butterfield, state commissioner of education in New Hampshire, and Dr. Bruno Roselli of Vassar College, were the principal speakers.

Commissioner Butterfield took for his topic "The Three Vocational Objectives" and listed these objectives as, skilled production, courteous commerce, and gracious living. He cited the educational ideals which had governed educational systems since the founding of the nation, declaring them to be founded solely on class distinction. He said that the Puritans not only set up their schools on the class-distinction basis, but conducted their religion along the same line.

Dr. Butterfield stated that the tendency to make many vocational programs academic was an unfortunate one and he illustrated certain lines in which this movement was clearly evident. He said that the whole progress and development of America were founded in the vocational field, pointing out that the first work of the early settlers was manual, and not academic. In closing, he said that the aim of education should be to make architecture, furniture, clothing and the commodities of daily life more attractive as well as establish standards of wholesome entertainment. He added that these things came in the province of art teachers, home-economics teachers, and the individual himself.

Dr. Bruno Rosselli of Vassar College delivered an illustrated address on "Lepis Magna, the New Pompeii Recently Discovered in North Africa." He related the history of this ancient city and traced the steps that led to its discovery and excavation. His slides showed the progress of the work there, as well as interesting pieces of art uncovered.

Thursday morning was devoted to visiting schools and exhibits. The afternoon was devoted to a series of sectional conferences. The art section, which had as its chairman, Raymond P. Ensign, director of the Art Extension Society, met in the auditorium of the Hartford Woman's Club. The speakers were A. H. Wentworth, director of art in the public schools of New Haven; James F. Barker, assistant superintendent of schools, Rochester, N. Y., and Florence E. Newcomb, head of the art department of Haaren High School, New York City.

One of the features of this session was Superintendent Barker's illustrated address on "Finding Art in the Clouds with a Camera."

Miss Alice F. Blood, director of home economics, Simmons College, Boston, was chairman of the home-economics section. The section on "Correlation" was in charge of Loretta J. Curran, assistant in manual arts, Boston public schools. The principal speaker at this section was the newly appointed dean of Rutgers College, Dr. Clarence E. Partch. Mr. Augustus F. Rose, director of manual arts, Providence public schools, was chairman of the manual-arts and vocational section.

Thursday evening, the assembly hall of the high school was packed to capacity. Mr. R. O. Small, state director of vocational education, Massachusetts, delivered a very spirited address on "Education in a Democracy." He was followed by Mr. Emil Fuchs, sculptor, author, and painter, who gave a practical demonstration of his art. After making a rapid sketch he demonstrated the process of etching through to the finished plate, copies of which he ran off in the press, much to the delight of his audience. It was the consensus of opinion that the value of practical demonstrations by master artists and craftsman cannot be overestimated.

The last address of the evening was delivered by Dr. Rollo G. Reynolds, Professor of Education, Columbia University. Professor Reynolds stressed the need of making the layman think about education and its importance and gave some valuable advice on methods of making contributions to newspapers.

Friday morning was devoted to visiting various industrial plants, schools and exhibits, and the afternoon was taken up by sectional meetings, all of which were well attended.

On Friday evening, nearly a thousand people sat down to the annual dinner filling the banquet hall of the Hotel Bond as well as a large additional room. During the evening, Mr. Frank E. Mathewson, made a few remarks concerning the growth of the Association and the plans for its future welfare. Mr. Solon P. Davis, first president of the Eastern Arts Association, gave some interesting "Memoirs." Mr. Royal B. Farnum, president of the Federated Art Council, outlined the progress made by the Council during the past year.

Dr. Henry Turner Bailey, delivered the principal address, taking for his topic, "Art and the Business Man." Dr. Bailey traced the art movement in educational fields during the past decade, pointing out the innovations in teaching methods and indicating how closely art is identified with the everyday life of the people.

The last session of the convention was held on Saturday morning. Following a brief business session, President Dillaway gave a short but interesting address.

Miss Irma Cofren, of the Massachusetts School of Art, delivered an illustrated address on "The Prague Congress," at the conclusion of which her listeners were thinking of how they could get to Prague this summer.

Dr. Arthur B. Mays, professor of industrial education, University of Illinois, gave an instructive address on "Industrial Education and the New Democracy."

The final address was made by Mr. Gerrit A. Benneker, artist, lecturer and author, which proved to be the outstanding address of the convention. He spoke in part as follows: "If the highest art of all is the art of living, then it lies within the realm of the fine arts to at least suggest the way of life, and within the field of arts and craftsmanship to work out the way of life.

"Apollo was not only the Greek of beauty, but of justice as well, and his statue was not kept in an art museum, but stood in the market place where men traded.

"The stream of life has come down to us through the ages. We are the trustees of that stream. What kind of trustees are we? The highest purpose of art is to reveal man to himself; to reveal the better characteristics in us to ourselves and to our fellow men; to dignify all necessary work; to raise business to a profession; to stimulate a pride in craftsmanship; to show the relative values of the individual to the work of the world; to build character."

The exhibit of arts and crafts work including the commercial booths, were housed in the state armory. It was probably one of the largest, if not the largest, ever held in the United States, and it was certainly the most pretentious exhibit in the history of the Association. Never before has the Eastern Arts Association attempted an exhibition on such an elaborate scale nor has it presented such a diversity of all forms of arts and crafts work. Mr. Joseph Wiseltier,

general chairman of the local committee and his able assistants, deserve the highest praise for making this exhibition such a decided success.

One of the outstanding features was the "Court of Honor" located in the center of the armory featuring the work to be sent to Prague next July as America's contribution to the International Art Congress. This part of the exhibition attracted much attention. It is estimated that over 60,000 people visited the armory during the three days that the convention was in progress.

Space will not permit the naming of all those who contributed so much toward the success of the Convention. President Dillaway proved to be a congenial and enthusiastic speaker. Vice-president Anderson received many congratulations as Chairman of the program committee; while the local committee consisting of Joseph Wiseltier, general chairman; Fred D. Wish, Jr., advisory chairman; Lawrence Wheellock, secretary and treasurer, put across a convention that left nothing to be desired and one that will go down in the history as something quite out of the ordinary.

Even with the hard work and cooperation of those mentioned above, it is doubtful if such a convention would have been possible without the inspiration and vision of the secretary, Mr. Frank E. Mathewson, to whom must be given credit for his consistent and untiring services in building up the Eastern Arts Association.

The following officers were elected:

President, Eric Anderson, assistant superintendent of schools, Providence, R. I.; vice-president, Joseph Wiseltier, supervisor of art, Connecticut State Department of Education; secretary and treasurer, Mr. Frank E. Mathewson, director of technical and trade education, Jersey City, N. J.

To fill the vacancy on the council created by the elevation of Mr. Wiseltier to the vice-presidency, Mr. Frederick W. Reed of the Framingham, Mass., Normal School was elected for a one-year term. Others elected to the council for three years were Mr. Forest Grant, director of art education in the New York City high schools; Mr. Charles A. Bradley, director of art in the State College for Teachers, Buffalo, N. Y., and Miss Gene P. Case, supervisor of home economics in the schools of Trenton, N. J.

THE MISSOURI TRADE AND INDUSTRIAL-EDUCATION CONFERENCE

The University of Missouri, cooperating with the state department of vocational education, called the First Annual Trade and Industrial-Education Conference at Columbia, Mo., May 18 and 19. The meetings were presided over by Prof. R. W. Selvidge, and the speakers were leaders in trade and industrial education in the state. Some seventy persons attended the various sessions and all pronounced this first meeting a profitable and successful one.

The meeting was opened with a discussion of "The General Industrial School" by Mr. C. L. Wetzel, state supervisor of trades and industries. There is a growing demand in the state for a more practical form of education for the youth who goes into industrial pursuits. The speaker placed before the group the evident purpose of the portion of the Smith-Hughes law relating to the establishment of the trade class in a small city, and discussed the program as it is being carried on in the seven state centers.

FIRST ANNUAL TRADE AND INDUSTRIAL-EDUCATION CONFERENCE, MISSOURI, MAY 18 AND 19, 1928

It was pointed out just how these classes are teaching the building and metal trades through the use of production jobs, and how through the use of analysis and record charts, the students are assured of a variety of training and the necessary amount of repetitive training on jobs. Considerable discussion hinged around the objective of the general industrial school and it was finally defined as a means of providing for advantageous entry into the trades allied with carpentry in the building-trades course, furnishing something more than a course in practical guidance into a trade.

Mr. E. C. Phillips, professor of shop production, University of Missouri, discussed "What a Trade Teacher Can Teach."

Mr. Phillips opened his discussion by pointing out two distinct phases of trade instruction: One phase dealing with the technical information and knowledge required in the practice of the trade; the other dealing with the manipulative processes, skills, and uses of materials. He called attention to the fact that the conditions of the schoolroom and school shop are such that the technical information and theories concerning the trade may be taught better in the school than in the industry. He also pointed out that it is practically impossible to duplicate in school, in any real way, the conditions in industry. The expensive equipment, the cost of materials, and the general atmosphere of the industry cannot be duplicated in the school within any reasonable cost. From this he concluded that the trade teacher should devote the major portion of his attention to teaching the technical information of the trade, together with certain fundamental tool processes, or skills which may be done within the limit of the school equipment, and that through a cooperative arrangement, the trade-school pupils should be taught the application of these things in the industry.

The Friday evening meeting was in the form of a dinner meeting, at which the main speaker, Prof. O. B. Badger, industrial teacher trainer, St. Louis, Mo., took for his subject "The Organization and Development of Apprentice Courses." In the past few years, there has been much said about training apprentices in the various crafts and a great deal has been accomplished, although many obstacles have had to be overcome. Too often attempts have failed, due to insufficient information about the nature of the work which the apprentice will do out on the job and the amount of related information which he needs to know to do the job. Other set-ups have failed because contacts were made with the wrong organizations, or the wrong person. Still others have failed because of the lack of an adequate follow-up.

The development of a successful apprentice class should take into consideration such matters as who has control of the apprentices, the employer or an organization; the "key" man; the apprentice committee; teachers who know their trades and can teach; the supplies and equipment needed; and a careful analysis of the trade. The time and the meeting place for the classes has an important bearing on the success of the class. Another factor which cannot be overlooked is that of giving the apprentice an opportunity to receive an all-around training on the job. Mr. Badger's talk was followed by an extended discussion after which Miss Grace Riggs, Principal of the Jane Hayes Gates Institute, Kansas City, described some of the problems confronting the girls' trade school in Kansas City.

At the morning session, Mr. H. H. Coxen, associate professor of industrial education of the University of Missouri, and assistant director of vocational education, Kansas City, discussed "The Selection and Organization of Related-Subjects Material."

Mr. Coxen showed how the related-subjects material is not, in fact, a matter of subjects, but consists of things that one must know in order to perform his work well and to gain advancement in the trade. The material is to be found by a careful listing of the various items of information required.

He further pointed out that, with a list of the things the men in the trades should know, it will be found that all trades do not require the same proportion of time on related information, and he suggested the possibility of fixing the time required for related subjects on the basis of time required for teaching the specific items. With such an arrangement, there is no specified time requirement in terms of years, months, weeks, or hours. The requirement is in terms of units of content. With a carefully planned system of individual assignments, the teaching may be done on an individual basis, and the work completed as quickly as the ability of the pupil permits.

At the afternoon session Mr. O. H. Day, director of vocational education and practical arts, Kansas City, discussed "Trade Training for the 14- to 16-Year-Old Boy."

Mr. Day pointed out that the 14-year-old boy in general, is quite incapable of wisely selecting a trade, and that he usually lacks the maturity which gives him a feeling of responsibility and determination to go forward in the work. He further pointed out that in the more highly skilled trades, for which boys are ordinarily prepared in trade schools, there is little demand for the boy of 16. The employer ordinarily is not willing to place responsibility on a youth of that age, even though he may have a considerable degree of skill. In the discussion which followed the talk, it was the consensus of opinion that intensive trade training, beginning at about the age of 16, gives better results, than training beginning at the age of 14.—*C. L. Wetzel.*

ANNOUNCE SEVENTH ANNUAL CONFERENCE ON PRINTING EDUCATION

The seventh annual conference on printing education will be held June 25 to 27, at the Carnegie Institute of Technology, Pittsburgh, Pa. About forty leaders in the printing industry, editors of printing trade journals, administrators and printing teachers will take part in the program.

The program will be divided into six sections. The opening session on Monday, June 25, will be of particular interest because

of a symposium on the topic, "If I Were a Teacher of Printing," which will be discussed by a printer, an engineer, a specialist, and a public-school administrator. The topics for the other meetings are "Training Craftsmen," "Share Your Knowledge," "Business and Education," "Major Educational Problems," and "The Printing Curriculum." The complete program is as follows:

Monday, June 25

Symposium. If I Were a Teacher of Printing, from the standpoint of a business man, Mr. George K. Hebb, Detroit, Mich.; an engineer, Mr. A. C. Jewett, Pittsburgh, Pa.; a specialist in industrial education, Mr. L. H. Dennis, Harrisburg, Pa.; a public-school administrator, Mr. Frank Leavitt, Pittsburgh, Pa.

Training Craftsmen. The Need for Trained Craftsmen, Mr. I. H. Blanchard, Blanchard Press, New York City; The Selection of Craftsmen, Dr. Walter B. Jones, University of Pittsburgh; Builders of Craftsmen, Mr. John M. Murray, Wiggins Trade School, Los Angeles, Calif.; Educational Program of Printing Craftsmen, Mr. John J. Deviny, Pittsburgh, Pa.

Tuesday, June 26

Share Your Knowledge. Sketches and Impressions, Mr. Edmund G. Gress, American Printer, New York City; The Service of the Public Library to the Printing Industry and to Education, Mr. C. B. Connelley, director of the Carnegie Library of Allegheny; School Publications as Proper Educational Material, Mr. George C. Hummel, Elm Vocational School, Buffalo, N. Y.; Printing School Exhibits, Mr. Chester A. Lyle, McKinley High School, Canton, Ohio.

Business and Education. The Business Demands of the Printing Industry, Mr. C. B. Nash, Standard Sanitary Mfg. Co., Pittsburgh, Pa.; Keeping Up to Date, Mr. Walter L. McCain, Editor of Printing, New York City; What the Printing School Demands of Industry, Mr. Harry E. Milliken, Worcester, Mass.

Wednesday, June 27

Major Educational Problems. Fundamental Problems in Printing Education, Dr. Gerald Whitney, University of Pittsburgh; Measurement Tests in Printing Education, Mr. Allan Robinson, Mergenthaler School of Printing, Baltimore, Md.; Professional Preparation for the Teaching of Printing, Mr. J. Orville Wood, Pittsburgh, Pa.; Blue Prints for Printers, Mr. F. T. Denman, Mergenthaler Linotype Company, New York City.

The Printing Curriculum. The Junior High School, Mr. James E. Gaffney, Elizabeth, N. J.; The Academic High School, Mr. R. L. Neigh, Harrisburg, Pa.; The Technical High School, Mr. Ralph W. Polk, Cass Technical High School, Detroit, Mich.; The Trade School, Mr. Fred J. Landon, Dunwoody Institute, Minneapolis, Minn.; The Teacher-Training Institute, Mr. C. W. Hague, Stout Institute, Menomonie, Wis.; The College of Printing, Mr. David Gustafson, Carnegie Institute of Technology, Pittsburgh, Pa.

CALIFORNIA VOCATIONAL ASSOCIATION TO HOLD MEETING AT BERKELEY

The California Vocational Association will hold a meeting on July 20 and 21, at the University of California, Berkeley. It is the plan of the Association to make these summer gatherings an annual affair, at which teachers may drop in during the vacation, or attend during the summer session.

At the general meeting, Dr. Edwin A. Lee will preside, and addresses will be given by Mr. E. W. MacQuarrie and Mr. William J. Cooper. The regular business session will be held in connection with the general session.

There will be sectional meetings on agriculture, commerce, home economics, industrial arts, part-time education, trade and industry, vocational guidance, and administration and supervision.

At the section on industrial arts, Mr. E. E. Erickson will preside, and addresses will be given by Mr. L. E. Stockwell and Mr. C. R. Scudder.

At the trade and industrial section, Mr. J. C. Beswick will preside, and addresses will be given by Mr. L. B. Travers and Mr. B. W. Johnson.

At the part-time section, Mr. G. C. Mann will preside, and addresses will be given by Dr. L. Lungren.

At this year's meeting, the efforts will be directed toward a revision of the constitution which will fix a working unit of the Association in each district of the California Teachers' Association. At the last annual meeting at Huntington Lake, the Association was the largest in the United States, having over a thousand members. The officers of the Association are: President, Mr. R. W. Heywood, Los Angeles; vice-president, Miss C. Erwin, San Jose; secretary-treasurer, Mr. F. A. Wright, Long Beach.

ERIK A. ANDERSEN ELECTED PRESIDENT

Mr. Andersen was elected president of the Eastern Arts Association at its recent meeting, held on April 18 at Hartford, Conn.

Mr. Andersen is a graduate of the Mechanic Arts High School, Boston, and has taken extension work at Lowell Institute, the Rhode Island School of Design, and also work at Brown and Harvard Universities.

He was the organizer and principal of the Providence Trade School, which was opened in May, 1918, in cooperation with the employers' and labor organizations, and was also the organizer and principal of four prevocational schools. For the last two years he has been assistant superintendent of schools at Providence, and previously was director of manual arts at Providence.

MR. ERIK A. ANDERSEN
Assistant Superintendent of Schools, Providence, R. I.
President-Elect, Eastern Arts Association.

Mr. Andersen is a member of the Rhode Island Association of Drawing and Manual Arts Teachers, and the Rhode Island Institute of Instruction. As organizer and director of the Providence Junior Achievement Foundation, he conducted a program of handcraft activities from 1923 to 1928 for 175 clubs, enrolling over 1,800 boys and girls.

JOSEPH WISELTIER ELECTED VICE-PRESIDENT

Mr. Wiseltier was recently elected vice-president of the Eastern Arts Association, which held its annual meeting April 18 to 21, at Hartford, Conn.

JOSEPH WISELTIER
State Supervisor of Art Education,
Hartford, Conn.

Mr. Wiseltier has been state supervisor of art education in Connecticut since 1923, and previous to that time was director of the Hartford Art School and supervisor of art education in New Britain.

At the present time, Mr. Wiseltier is a special lecturer on art education for the department of fine arts at Teachers College, Columbia University, and he also acts as instructor in the summer session of

Columbia University. He is a graduate of the teachers' college training school for teachers and holds the degree of B.S.

VICE-PRESIDENT, WESTERN ARTS ASSOCIATION

Mr. McCloskey, who was recently elected vice-president of the Western Arts Association, is director of the technical work in the schools of Lakewood, Ohio. Mr. McCloskey is a graduate of teachers' college, Columbia University, and has completed special graduate courses at Stout Institute, Bradley Institute, and Columbia University.

MR. JAMES H. McCLOSKEY
Vice-President, Western Arts Association,
Lakewood, Ohio

Mr. McCloskey has been a member of the Association since 1911, and was in charge of the manual-arts round table of the association in 1927.

CHAIRMAN OF THE WESTERN ARTS MANUAL-TRAINING SECTION

Mr. Van Duzee, who was recently elected chairman of the manual-training section of the Western Arts Association for 1928, is supervisor of industrial arts at West Allis, Wis.

MR. ROY R. VAN DUZEE
Chairman, Manual-Training Section,
Western Arts Association

Mr. Van Duzee is a graduate of Stout Institute, and has been a teacher and supervisor of industrial arts since 1911. Previous to coming to West Allis, he was supervisor of industrial arts at Bismarck and Minot, N. Dak. He is a frequent contributor to professional magazines and is co-author of the Nash-Van Duzee industrial-arts tests.

PRESIDENT OF WESTERN ARTS ASSOCIATION

Miss Scovel, who was recently elected president of the Western Arts Association, is a native of Chicago. She was educated in the Hyde Park High School of Chicago, the Chicago Normal College, the Art Institute, and Pratt Institute, Brooklyn, N. Y., and has completed special graduate courses at Bradley Institute and at several art schools in the East.

MISS MARY SCOVEL
President, Western Arts Association
Chicago, Ill.

Miss Scovel was an instructor of art at Bradley Polytechnic Institute, the Minneapolis Handicraft Guild, and supervisor of art in the schools of Chicago and Oak Park. She is at present head of the teacher-training department at the Art Institute of Chicago. She has been instructor of summer courses at the Normal University, Ohio State University, and the Snow-Froehlich Industrial Art School of Chicago, and will spend this summer at the Boothbay Studios, Boothbay Harbor, Maine.

Miss Scovel is a frequent contributor to the periodical literature on art. She is a member of the Federated Art Council on Education and is a frequent speaker at the art clubs and teachers' associations.

Western Industrial Education Association Holds Fourth Annual Meeting in Denver. The fourth annual convention of the Western Industrial Education Association was held May 4 and 5, at Denver, Colo. One hundred and fifty industrial executives and 31 state supervisors and city directors of industrial education were present at the meeting.

At the meeting, brief addresses were made by Mr. C. C. Gates, Denver; Mr. Frank Cushman, of the Federal Board for Vocational Education, Washington; Mr. R. W. Hambrook, Federal agent for industrial education on the Pacific Coast, and Mr. John C. Beswick, president of the Association.

Sectional meetings on railroads, sugar, mining, oil, baking, welding, and lumber were conducted. Mr. S. Lewis Land, of the trade and extension bureau, was in charge of the section on plumbing and heating.

At the business session, the following officers were elected:

President, Mr. D. W. Rockey, Albuquerque, N. Mex.; vice-president, Mr. N. B. Giles, Boise, Idaho; secretary, Mr. H. A. Tiemann, Fort Collins, Colo.; treasurer, Mr. F. M. Treat, Cheyenne, Wyo.

Manual-Arts Teachers of Southern Illinois Meet. The manual-arts teachers of southern Illinois held a meeting at Benton, on April 28. There was a large attendance of manual-arts teachers representing thirteen different towns in the southern section of the state.

At the morning session, Mr. Denny of Belleville, talked on "The Advisability of Instruction Sheets," and Mr. Lease of Granite City, gave a talk on "Job Sheets vs. Instruction Sheets."

At the afternoon session, Mr. Joyce of Murphysboro, talked on "Shop Fees and Sales of Hardware"; Mr. Stables of Mt. Vernon, on "The Sale of Lumber"; and Mr. Trapp of Johnson City, on "The Sale of Finishing Materials."

At the business session, Belleville was selected as the place for the fall meeting, which is to be held about the first of December. Mr. H. D. Fortney of Centralia, was reelected as corresponding secretary.

MR. TURNER BECOMES HEAD OF RANKEN SCHOOL OF MECHANICAL TRADES

Mr. Orville H. Turner, who has recently been appointed as superintendent of the Ranken School of Mechanical Trades, St. Louis, Mo., is a native of Missouri and was educated in the schools of that state. He is a graduate of the University of Missouri and holds the degree of bachelor of science in electrical engineering.

Mr. Turner was a teacher in the public schools for three years during his university course. After graduation from the university he entered business, and later became the editor and publisher of a country newspaper.

O. H. Turner, Superintendent of the Ranken School of Mechanical Trades, St. Louis, Mo.

After a varied career, Mr. Turner returned to the educational field. In 1913, he was appointed on the staff of the Ranken School of Mechanical Trades at St. Louis. After five years spent as an instructor and one year as head of the English department, he was appointed assistant superintendent. He remained in this position until the death of Mr. Gustafson in August, 1927, when he became acting superintendent.

In the appointment of Mr. Turner, the school has secured a worthy man, and one who was a friend and colleague of Mr. Gustafson for the past fifteen years.

NEW BOOKS

Problems in Furniture Design and Construction

By A. S. Madsen and Jos. J. Lukowitz. Cloth, 133 pages, 7⅞ by 10½, illustrated. Price, $3. Published by The Bruce Publishing Company, Milwaukee, Wis.

This book contains designs for more than 60 pieces of furniture, each piece being illustrated by a well-made detail drawing and by a halftone of the finished product. Sufficient explanatory matter to clear up constructional difficulties accompanies each design.

The book also contains information relative to surface embellishment and finishing. The authors have succeeded in collecting a very interesting set of designs which cannot fail to draw favorable comment from teachers in woodwork and others who delight to work in wood at home.

Teaching Aids for the Asking

Selected by Homer J. Smith. Paper, 60 pages, 6 by 9. Price, 50 cents. Published by The University of Minnesota Press, Minneapolis, Minn.

The author has compiled an excellent list of pamphlets, job sheets, wall charts, and illustrative material which will assist the teacher in doing his job in a more efficient manner.

The list gives the names and addresses where the busy teacher can obtain valuable teaching material on the following topics: Trees and woods; woodwork and carpentry; wood finishing and interior decoration; structural materials; drawing, plan-reading, and estimating; plumbing, heating, and ventilation; brickwork, masonry, and concrete; electricity; sheet metal; metals and metal working; abrasives and grinding; lubrication; automobile work; printing; and miscellaneous.

How to Make a Concrete Flower Box

By Kenneth L. McCulloch. Paper, 8 pages, 5 by 8, illustrated. Price, 15 cents. Published by Practical Arts Publishing Co., Elizabeth, N. J.

This is one of a number of interesting little pamphlets which will be found useful by the industrial-arts instructors and those who are interested in work for the home shop. The little booklets are well illustrated and clearly written. They are edited by Charles D. Patrick. At present 26 of them covering quite a wide variety of projects are available.

The Placement Problem in the Part-Time Vocational School (Vocational Education Monograph No. 12)

By Jean Bernard. Paper, mimeographed. Forty-seven pages with an appendix of four pages. Published by the Milwaukee Vocational School, Milwaukee, Wis.

This study was made by the division of vocational teacher training and research of the Milwaukee Vocational School. It sets forth the factors which enter into the placement problem, the method of conducting the survey, the form of the questionary used in obtaining the information from the students, the instruction sheet to the instructors who used the questionary in their classes, and the evaluation and interpretation of the data. This study may well serve as a model for other institutions who are attempting to solve the placement problem.

Furniture Inlaying

By Charles W. Frost and Margaret Fullerton. Cloth, 140 pages, 6⅞ by 10¼, illustrated. Price, $2.75. Published by The Bruce Publishing Company, Milwaukee, Wis.

This book is designed for the use of the student, the amateur and the artisan. It gives many examples of designs which come down to us from the old masters, and it shows how the modern inlayer can adapt the older ideas to the problems which confront the furniture maker of today.

The entire field of furniture inlaying is interestingly covered in ten chapters enumerated herewith: History of the art; Design; Making lines and bands; Inlaying lines and borders; Intarsia; Intarsia applied to turned projects; Marquetry; Veneer and veneering; Finishing; Materials for inlaying.

Picture Values in Education

By Jos. J. Weber. Cloth, 156 pages, 5 by 7¾, illustrated. Published by The Educational Screen, Inc., Chicago, Ill.

This book will be found interesting by anyone who has anything to do with newer methods of classroom instruction.

Reading Building Plans

By E. L. Bowman. Paper, Vol. I, 48 pages. Vol. II, 69 pages with 24 blue prints. Published by The National Clay-Products Extension Bureau, Columbus, Ohio.

This mimeographed material is designed as a blue-print-reading course for bricklayer apprentices. It is divided into nine parts titles of which are as follows: How a building is planned; A set of plans; The reading of simple plans; Construction details; Garage plans; Plans for a bungalow; Plans for a two-story house; Plans for an apartment house; Plans for an office building.

Newkirk-Stoddard Home-Mechanics Test

Lewis V. Newkirk and Geo. D. Stoddard. Forms A and B with Class-Record Sheet, Keys, and Manual of Direction. Unit set, 25 cents, postpaid. Published by The Bureau of Educational Research and Service, University of Iowa, Iowa City, Iowa.

This test has been developed by an instructor in home mechanics and by a leading expert in standard tests and testing. Its chief purpose is "to measure in an objective and diagnostic manner the essential knowledge that the pupils should acquire from a well-organized course in home mechanics." The two forms are closely equivalent and provide 36 jobs each, the purpose of which is to determine whether the students can list in correct order each of five or six procedures necessary to do each of the jobs.

The difficulty of a test of this kind is well stated by the authors when they say "to the extent that test users accept the validity of the Newkirk-Stoddard jobs, there is justification for saying that pupils ought to know these jobs, and as a corollary to this, that the work in home mechanics may be partially evaluated according to the performance of pupils in the test."

Elementary Geography

By Frank M. McMurry and A. E. Parkins. Cloth, 340 pages. Illustrated. The Macmillan Company, New York City.

A complete revision of a book first published in 1921.

Mechanical Drawing

By Raymond W. Perry. Paper, 19 pages. Issued by the Division of Vocational Education, Rhode Island State Department of Education, Providence, R. I.

This brief pamphlet outlines basic principles and conventions for mechanical drawing and is intended for the Rhode Island schools. It is a constructive contribution to the standardization of the subject.

England and Ireland

By Richard Bennett. The University of Washington Bookstore, Seattle, Wash.

Twelve woodcuts representing work of a modern master illustrating his charming but vigorous style are here presented. A foreword is provided by Zona Gale.

NOW, ARE THERE ANY QUESTIONS?

Finishing Floor Lamps

798. Q.: Can you send me suggestions for finishing floor lamps and other things made of iron pipe and strap iron, for hammered surfaces and smooth surfaces? I would like to know some ways of finishing to preserve the natural color of the iron but prevent rust and another more ornamental finish for use where wood and iron are combined.—*R. N.*

A.: The old-time "armor bright" finish used when I was a chemist for Gustav Stickley was produced by first going over the metal work with the ball of a heavy ball-peen hammer to give a careful reproduction of tool marks. Next the piece was rubbed or buffed with a fine emery cloth backed with thick rubbing felt, the rubbing being done in only one direction. If the effect was still not what was desired, it was again rubbed with FFF pumice stone, felt, and water. After drying in a warm kiln, the piece was then sprayed with a clear lacquer. Thin white shellac or brushing lacquer also may be used. When dry, a wipecoat was made up of drop black ground in japan and thinned with turpentine. This was carelessly brushed on and before entirely dry was wiped off with a soft rag leaving only a trace of the black in the hammer marks. In case the color sets up too hard before wiping is complete, use a rag dampened with turpentine.

Lately I have worked out some very good results for reproducers of antique fireside furniture by using brushing lacquer, dark gray, coloring with pigments in japan to a reddish brown to imitate discolored copper, as a ground coat. When this was hard I made a stipple coat of light gray lacquer shaded with a trace of bright green lacquer to produce a slightly greenish gray with a bright tone, similar to the green of old copper roofs and gutters. A little of this lacquer was brushed on a piece of tin, a very rough, old sponge was pressed into the lacquer and then pounced irregularly upon the ground coat until the desired effect of mottled copper was produced. Do not get a too green effect; on the other hand, have enough green to keep the effect from becoming dead or dull. When dry, wax and brush to a polish if desired, but generally speaking the lacquer shines enough of itself.—*Ralph G. Waring.*

Removal of Paper on Varnished Surfaces

800. Q.: How is paper taken off that has stuck to the top of a varnished surface? The piece in question is an old-fashioned stand on which a piece of paper has been placed and has stuck so tightly to the varnish that it can't be removed.—*H. M.*

A.: You might try softening it with alcohol and taking it off by rubbing. We fear, however, that the best thing to do is to remove the entire varnish from the surface and do the job over again.

Canvas-Covered Canoes

801. Q.: Can you furnish us with information about canvas-covered canoes?—*R. B.*

A.: You will find information on canvas-covered canoes in the following two books:

"Canvas Canoes and How to Build Them," Field. Price, 50 cents. Published by Forest & Stream Publishing Co., New York.

"How to Build a Canvas Canoe," Hall. Published by Lothrop, Lee & Shepard, Boston, Mass.

Rubber Goods

802. Q.: I would appreciate information as to the source of supply for articles and materials, rubberized rayon cloth and gossamer rubberized cloth, such as would enter into the manufacture of raincoats, etc. We also desire information as to the source of supply for rubber cement, silk-covered elastic bands and cords.—*A. C. B.*

A.: *Rubberized Cloth.*—Seamans & Cobb Co., 140 Essex St., Boston, Mass.; Boston Woven Hose and Rubber Co., Cambridge, Mass.; Newark Rubber Co., 2 Orange St., Newark, N. J.; Crown Rubber Mfg. Co., 386 Evergreen Ave., Brooklyn, N. Y.; Park Products Co., 8th and Locust Sts., Philadelphia, Pa.; Pocono Rubber Cloth Co., Trenton, N. J.; Marathon Rubber Products Co., Wausau, Wis.

Rubber Cement.—Rubber & Cements, Inc., 3026 South LaSalle St., Chicago, (raincoats); Chemical Research Co., Lynn, Mass.; Biller, Adolph, Leather & Rubber Cement Co., Trenton, N. J.; Columbia Cement Co., 31 Wyckoff Ave., Brooklyn, N. Y.; Quality Cement Co., Fernwood, Pa.; Montgomery Bros., Inc., Penrose and Packer Sts., Philadelphia, Pa.

The Cause of Planer Marks

803. Q.: Can you tell me what causes the mill or planer marks in surfaced stock? I thought it may be due to the space between blades in the cutterhead.—*W.C.R.*

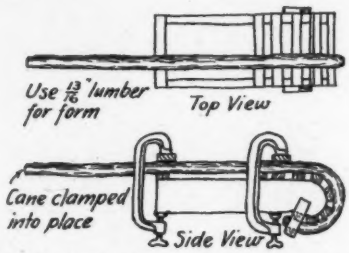
A.: The mill or planer marks in surfacing stocks may be attributed to one or more of three causes.

1. The stock may have been pushed across the cutter too rapidly.
2. The planer may not be running at the proper speed.
3. The bearings may be loose so that the cutterhead jumps and causes the indentations.

Bending Hickory

804. Q.: We want to bend air-seasoned hickory sticks with a hook handle for walking sticks and wonder if you can give us detailed information as to making forms and methods of handling. We have steam retort but the rest of it is all new to us.—*E.B.W.*

A.: On page 32 of the Jan. 1925, issue of the INDUSTRIAL-ARTS MAGAZINE, there is an article on skis and ski bending. I am taking the information relative to bending hook handles on hickory walking sticks from this article.



The foregoing sketch shows a form patterned after the one used for bending skis. It is practically self-explanatory.

Soaking the hickory sticks for about 10 hours before steaming helps to soften the wood fibers. The hickory being such a hard wood may have to be steamed several hours to make it pliable enough for bending.

Finishing of Cypress

808. Q.: We are finishing some pedestals made of cypress and would like to know of an appropriate finish or finishes to use.

This is the first time we have used cypress and are therefore quite in the dark how to finish them. One authority says that water stains do not agree with cypress. Is that statement correct? Is potassium dichromate a reliable chemical to use? Iron acetate?—*G. W.*

A.: Cypress is not a good wood to use in connection with water stains, although I have worked out a method whereby this can be done, commercially. I much prefer to use an asphaltum stain, shaded with oil soluble reds, blacks, orange or browns. The asphaltum varnish should, however, be used as a binder. I would not use potassium dichromate on cypress since this necessitates a water solution, which would result in an extreme raising of the grain. Ferric acetate is subject to the same criticism.—*Ralph G. Waring.*

Prevent Squeaking Floors

811. Q.: Will you kindly tell me if there is anything one can do to prevent floors from squeaking?—*C. B. H.*

A.: Squeaking floors can be silenced in one of two ways. The first and best way is to take up the squeaking portion of the floor and relay it. This is by far the best method. The second method is to face-nail the floor. This may silence the squeaking but the nails will show.

Refinishing Violins

812. Q.: Can you direct me to a source of information concerning the method of refinishing violins and still retain the aged appearance.—*E. A. F.*

A.: The finishing of violins is one of the few remaining trades regarding which so-called "trade secrets" still apply. No amateur should attempt to do this work, since it involves the results of years of experience. When I tell you that one coat of the wrong kind of varnish, or varnish applied under adverse conditions will ruin the tone of the instrument, you will appreciate the difficulties which exist. Violin varnishing should not be done except by a reputable manufacturer, as Lyon and Healey of New York and Chicago, or the Clark Music Co., instrument makers of Syracuse, N. Y. If the violin has any real value, it is worth a small charge to have it refinished by trained men. I am not justified in offering a specification which might be rendered worthless in the execution.—*Ralph G. Waring.*

Dog Sled

One of our correspondents would like to have a drawing for a dog sled. Can any subscriber accommodate him?

THE FINE ART OF SELECTING THE RIGHT HAMMER

Are your hammers Quality hammers? Are they of the correct weight?

The heads of Stanley Hammers are made of carefully selected steel. They are drop-forged and correctly tempered. The eye of the hammer is tapered from the center in both directions according to a special Stanley design. When the Stanley Patented Wedge is driven home it is almost impossible for the head to come off, and the tapered eye stops the head from working down on the handle. The claws are carefully sharpened so that they will pull the smallest brad.

The weight of every Stanley hammer is stamped on its cheek. The Stanley No. 12, shown here, is recommended for school work. It comes in 5, 7, 10, 13, 16 and 20-ounce weights (weight of head only).

The 10-ounce hammer is generally used in the elementary grades; the 13-ounce in high school shops, and the 16-ounce in trade schools. The 16-ounce is the regular artisan's size.

The catalog number does not show the weight of the hammer. When ordering, specify the catalog number and the weight you want.

THE STANLEY RULE & LEVEL PLANT
Educational Department, New Britain, Conn.

The Patented Stanley Wedge makes it almost impossible for the head to come off.

STANLEY TOOLS

STANLEY TOOLS

Valuable Tables

In addition to fulfilling its primary job as the leading textbook on twist drills and drilling practice, the "Handbook for Drillers" contains several valuable tables of Cutting Feeds and Speeds. These tables are in constant daily use in hundreds of the largest machine shops in America.

Copies of the "Handbook," in any reasonable quantities, will be furnished free to supervisors and instructors of industrial and vocational education for use as textbooks by students in machine shop practice.

The CLEVELAND TWIST DRILL COMPANY CLEVELAND
NEW YORK-CHICAGO-LONDON SAN FRANCISCO
TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

PERSONAL NEWS NOTES

Mr. R. H. Rodgers, chief of the division of teacher training and research at the Milwaukee Vocational School, Milwaukee, Wis., will conduct a course in job analysis and curriculum construction, and another on occupational studies in a program of vocational guidance, at the University of Wisconsin, during the 1928 summer session.

John T. Faig was elected president of the Cincinnati Vocational Guidance Association.

Miss Beula M. Wadsworth, director of public-school art at Kalamazoo, Mich., has announced her resignation, which becomes effective with the close of the school year. Miss Wadsworth, who has been interested in journalistic work for some time, will become assistant editor of a prominent art magazine. Miss Wadsworth has frequently written for art publications during the past three years and is the author of a book which is shortly to be placed on the market.

Mr. Peter Farmer has been appointed as instructor in auto mechanics in the trade school at Joplin, Mo. Mr. Farmer succeeds R. S. Skelton, who has resigned.

Mr. Hampton T. Hall of New Hampton, Iowa, has been appointed as instructor in vocational agriculture at Charles City.

Mr. L. W. Fox has been reelected as director of industrial education at San Antonio, Tex.

Mr. R. A. Harrison has been elected as vocational teacher at Lockhart, Tex.

Miss Emma Pirie has been elected director of home economics in the schools of San Antonio, Tex.

Mrs. E. E. Faulkner has been added to the home-economics staff at San Marcos, Tex.

Mr. W. L. Davis, of Dallas, Tex., has been appointed instructor in auto mechanics in the evening schools.

Mr. Canby Trout has been elected director of industrial arts at Sherman, Tex.

Mr. Clarence Parker has been elected instructor in shop and drawing work at Bryan, Tex.

Mr. Elmer A. Stephan has been chosen to succeed Mr. James C. Boudreau as director of art at Pittsburgh, Pa.

Mr. Philip Fitch has been appointed principal of the Manual Training High School at Denver, Colo., to succeed Mr. Charles A. Bradley, who has retired after 45 years of service.

Mr. Fitch is a graduate of the East High School, Denver, and holds degrees given by the Colorado College and the University of Denver. He completed several courses at the University of Chicago, and attended two summer terms at teachers' college, Columbia University.

Mr. Fitch has made an outstanding success as an assistant principal and possesses those qualities which are necessary in a successful principal.

PUBLICATIONS RECEIVED

Vocational Education—The Choice of a Lifework. Bulletin No. 16, March, 1928. Issued by the State Board for Vocational Education, Lincoln, Nebr. This bulletin gives the comparative results of two studies of lifework choices of Nebraska high-school boys and girls. The data shows the trades selected by boys and girls, the groups of occupations in the order of preference, the most popular choices, and the principal occupations in Nebraska in 1910 and 1920. Only 201 different occupations were mentioned by 25,914 pupils who answered the inquiry. The popular occupations, it was found, were not more than 31 in number. Preference for professional life was expressed by 12,585 boys and girls. The report indicated that some progress has been made in the vocational-guidance program insofar as it relates to information concerning the wide range of lifework opportunities offered today.

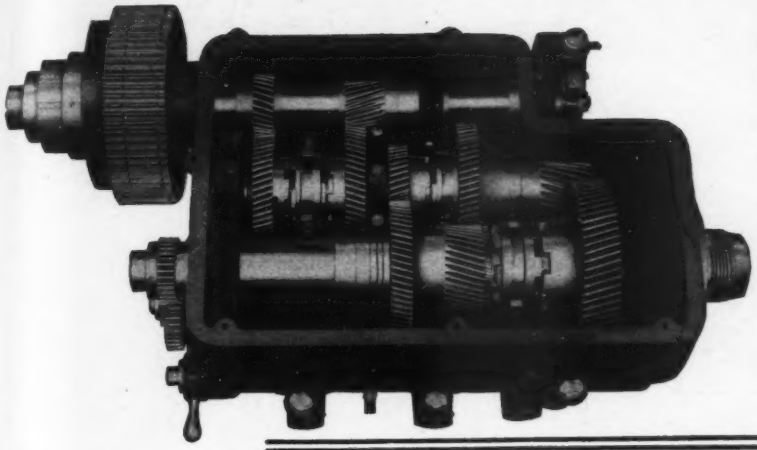
Handy Manuals of Standard Employment Practice. Job Specification No. 1. Published by the Metropolitan Life Insurance Company of New York City. The job specification is a useful and convenient form for standardizing and summarizing the knowledge about the job. The specification is prepared by the foreman of each department and has been successfully employed by some of the large industrial plants. Some definite qualifications have been set up for such occupations as screw-machine operator, machinist and toolworker, and other kinds of work. The booklet gives typical job sheets, occupational data cards and position specifications.

Bibliography on Foremen Training. Prepared by Mr. Frank Cushman. Trade and Industrial Series No. 35, of Bulletin No. 128, April, 1928. Issued by the Federal Board for Vocational Education, Washington, D.C. This is a selected and annotated list of references on recent books, pamphlets, and magazine articles for the use of men who are conducting foremanship courses. The bulletin offers a practical working list of valuable material for the benefit of those directly connected with various types of foreman training.

What is an Engineering Education? General Series Bulletin No. 4, Vol. 18, Missouri School of Mines and Metallurgy, Rolla, Mo. This bulletin of seven pages has been prepared to place before students and advisers in secondary schools, information regarding this branch of learning. The bulletin is not intended to influence boys in the choice

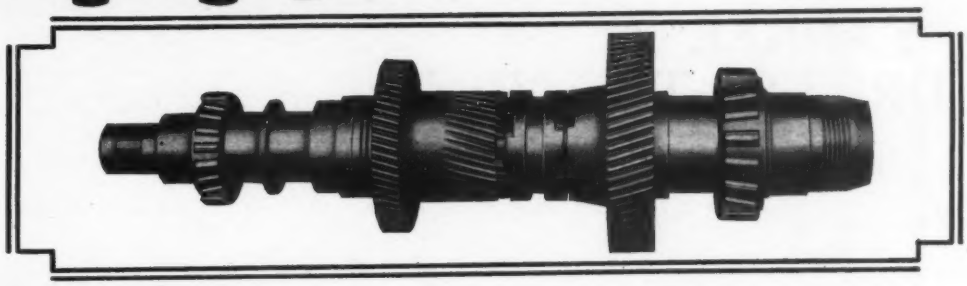
(Continued on page 30a)

Inside Facts about.. Monarch Lathes



AT THE left is shown an "inside" view of the Monarch eight-speed *Helical geared, Timkenized headstock.* Many features, exclusively Monarch, have put hundreds of Monarch lathes in 181 railroad shops, and thousands of them into the largest and most successful industrial plants all over the country.

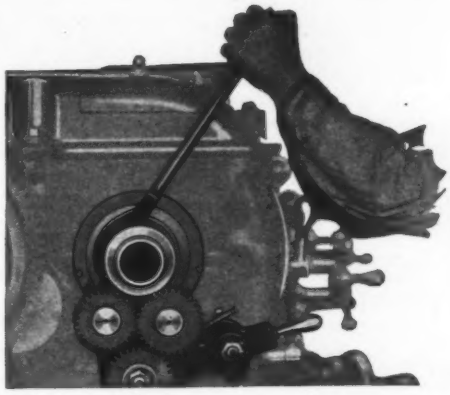
Below is shown the Monarch *Timkenized* spindle. This superior spindle mounting insures greater rigidity, extreme precision, longer bearing life, maximum thrust absorption, permanency of gear alignment, freedom from chatter and gear tooth marks—and, most important of all, almost complete elimination of friction with more power delivered to the cutting tool.



THE illustration at right shows the extreme simplicity with which the Monarch Timkenized spindle may be kept in perfect alignment. Adjustment is quickly and easily made by tightening the adjusting collar with a spanner wrench. Only infrequent adjustment is necessary in order to remove all end and radial play of the spindle in its bearings.

Write for further information as to why YOU should use *Timkenized* lathes—and why they should be Monarch Helical-geared, Timkenized Lathes in preference to any other.

Monarch Lathes are ideal for training purposes and are well within the reach of vocational school appropriations.



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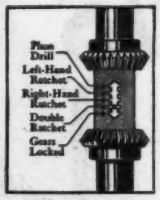
Monarch lathes

Helical Gears - Timken Bearings

SMOOTHER..QUIETER..MORE POWERFUL

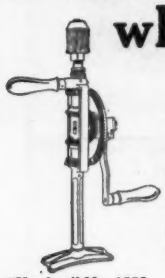


Five "Yankee" Ratchet adjustments. Controlled by Shifter between small gears. Changed at finger-touch.

"Yankee" Double Ratchet causes drill to cut continuously, with only a slight forward and back motion of crank.

"Yankee" Ratchet Drill lets you do the awkward job in the easiest way.

"YANKEE" DRILLS—They Work where others can't



"Yankee" No. 1555

"Yankee" No. 1530

The various "Yankee" adjustments, including left-hand ratchet, right-hand ratchet, and DOUBLE ratchet, give these "Yankee" Drills a range of usefulness, speed, and efficiency unknown in ordinary breast and hand drills.

With DOUBLE ratchet adjustment drilling is continuous on both forward and back movements of crank and no matter how slight.

"Yankee" No. 1555 — Ratchet Breast Drill. Length, 17". Two speeds. Three-jaw chuck; capacity, ½". Price, $11.00.

No. 555 — Two-jaw; ½", round or square. Price, $11.00.

"Yankee" No. 1530 — Ratchet Hand Drill. Length, 10½"; weight, 1¼ lbs. Five ratchet adjustments. Three-jaw chuck; ¾". Price, $5.25.

"YANKEE" *on the tool you buy means utmost in quality, efficiency and durability.*

"Yankee" Breast and Hand Drills are made in eighteen styles, ranging from $3.00 up. All are illustrated and described in the "Yankee" Tool Book, sent free.

North Bros. Mfg. Co., Philadelphia, U. S. A

"YANKEE" TOOLS

Make Better Mechanics

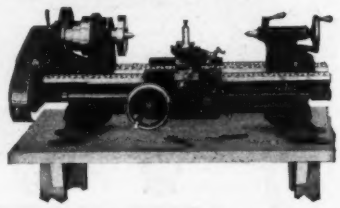
SCHOOL SHOP EQUIPMENT NEWS

For the Supervisor and Teacher who desires to keep abreast with news of new Machinery, Tools, Supplies, etc.

NEW TOOLROOM PRECISION LATHE

The latest product of the South Bend Lathe Works, South Bend, Ind., is a toolroom precision lathe. This 13 in. by 5-ft. lathe is built to meet the most exacting requirements of the mechanic. It is a back-geared, screw-cutting tool, with eight spindle speeds, of which four are of the direct-belt type, and four are obtainable through the back gears.

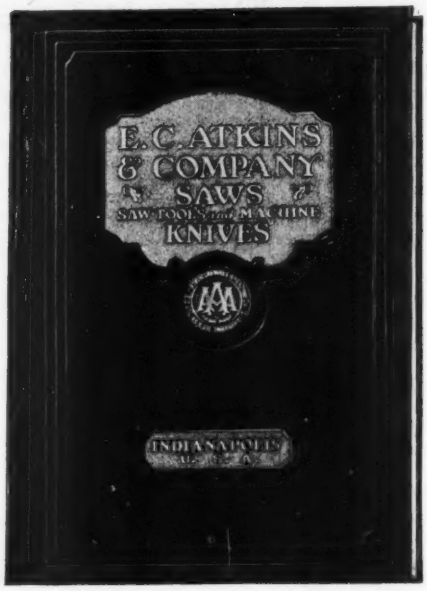
Among the special attachments to be found on the lathe is a handwheel draw-in collet chuck for the production of small parts as well as for general toolwork, round, square, and hexagonal collets which are adaptable to tubing or bar work; and a headstock spindle for the insertion of long rods or bars up to 1 in. in diameter. The lead screw is cut with a master lead screw to produce the accuracy required for fine toolroom work. The attachments available for use on this lathe are: a taper attachment, thread dial, micrometer carriage, stop, and collet cabinet and bracket.



The lathe is built to perform all kinds of precision work in the toolroom. It will machine master gauges, master screws, taps, dies, jigs, fixtures, and all kinds of precision turning, facing, drilling, boring, reaming, knurling, chucking, thread cutting, and other forms of close precision work. The lathe may be driven by an overhead countershaft, or by three types of direct-motor drive.

NEW CATALOG OF ATKINS SAWS AND SAW TOOLS

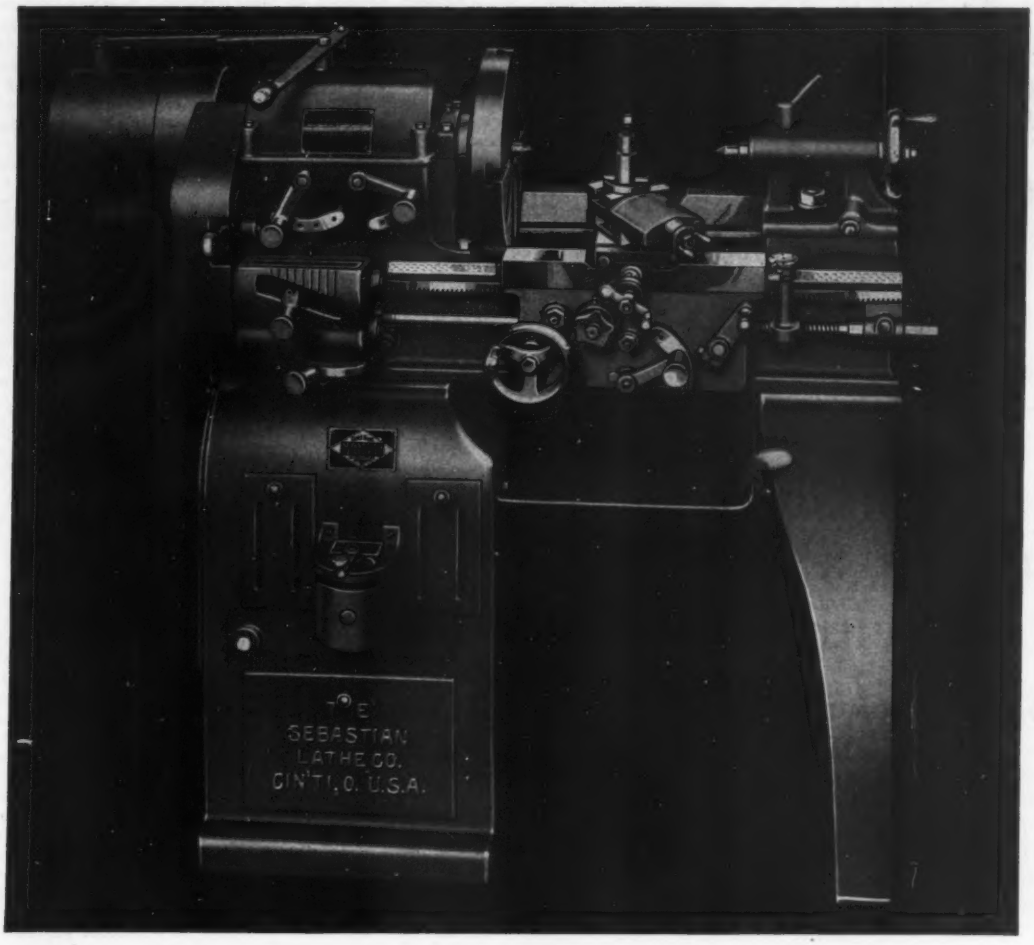
The E. C. Atkins Company of Indianapolis, Ind., has just issued its new Catalog No. 20, describing and illustrating the Atkins saws, saw tools and machine knives.



The high quality of the catalog reflects the quality of Atkins products, which embrace saws of all kinds, saw tools, saw specialties, bench, wall, and floor scrapers, machine knives, grinding wheels, cantol belt wax, files of all patterns, and many other items.

The catalog gives the dimensions and prices of the items listed.

"a lathe without an alibi"



The Perfect Lathe For Schools

The needs of the manual training shop have been closely studied and as a result we have developed this 11″ Gold Seal Heavy Duty Lathe.

Its distinguishable points are:—1. It is a small lathe with large lathe capacity.—2. It is oversized at every point.—3. It is absolutely safe.—4. It is practically unbreakable.—5. It is "sized" down to the student.—6. It is compact and not more "lathe" than you need.—7. It is the type lathe your Student will operate when he finishes School and gets into Industry.

The Sebastian Lathe Company

Cincinnati, Ohio.

Send the attached coupon for detailed information and specifications.

Coupon

The Sebastian Lathe Co.,
Cincinnati, Ohio.

Send descriptive Bulletin of your New 11-inch Lathe.

Name.....

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IAM-7

Give your best students a chance to work with *America's best wood*—

Now—when you're laying plans and requisitioning materials for the fall term—is the time to order some genuine American Walnut.

It's not for the beginners, we'll admit, nor for those poor, futile lads whose fingers are eternally all thumbs. But for the boys who show promise, you can give them no finer reward than a chance to work with walnut.

For in walnut, they have a medium which constantly inspires them to do their best, a wood in which beauty of color and figure invites beauty of workmanship. And a wood which is so proof against splitting and cracking that there is little danger of youthful craftsmanship going for naught.

Our booklet on "The Story of American Walnut" will give you much valuable information with which to instruct your students in the history of walnut's use and the more simple facts as to its physical characteristics. Use the coupon to secure your copy—gratis, of course.

American Walnut Manufacturers Association
Room 3407, 616 South Michigan Ave., Chicago, Ill.

Please send me your brochure on American Walnut.

Name_____

Address_____

AMERICAN WALNUT

(Continued from page 26a)

of a career, but it is the purpose to set before them while in the high school, information that will help them in choosing their preparatory work for this branch. The bulletin analyzes typical engineering curricula, shows the time required in various subjects, and suggests broadly, courses to be pursued in these schools by those who expect to follow the engineering profession.

Modern Methods of Measurement. A report on hearings on the Britten metric bill before the U. S. House of Representatives.

The Constant and Variable Occupations of the United States in 1920. By R. H. Ojemann. Price, 25 cents. Bulletin No. 35, 1927, issued by the Bureau of research of the University of Illinois, Urbana. This booklet is a revision and elaboration of an earlier report prepared by Col. Leonard P. Ayres. The information given shows the trend of constant and variable occupations, which should prove helpful to teachers and supervisors interested in the problems of industrial arts and vocational education.

Vocational Agricultural Education in Wisconsin. Prepared by George P. Hambrecht, Madison. Bulletin No. 9, 1927, issued by the State Board of Vocational Education, Madison. The booklet is a report of the work done by the agricultural division of the state board for the years 1924-25 and 1925-26. One of the outstanding developments of the past two years has been the growth in part-time and evening-school work in agriculture. Short-unit courses are being offered by practically every department of vocational agriculture in the state to give farm boys specific training along the lines they most desire. A course in farm economics including farm records, accounts, and farm management has been introduced in a number of schools. In some cases, attention has been given to special phases of these subjects.

Analysis of Operative Jobs of a Corn-Growing Enterprise. By C. H. Schopmeyer. Bulletin No. 118, May, 1927, issued by the Federal Board for Vocational Education, Washington, D. C. The pamphlet is an analysis of the operative jobs in a corn-growing enterprise in Maryland and is directed to vocational teachers in all types of agricultural schools.

Manual for Conference Leaders in the Retail Meat Business. Prepared by Earl W. Barnhart. Bulletin No. 123, July, 1927, issued by the Federal Board for Vocational Education, Washington, D. C. This is a report of a conference for developing a better understanding of how to do certain kinds of work in vocational education. The pamphlet is based upon the conference procedure developed by the Federal Board and contains the principles of the Federal Board in a form suitable for the information of retail merchants who are engaged in an educational program.

Elements of an Educational Program for Laundry Salesmen. By Earl W. Barnhart. Bulletin No. 119, June, 1927, issued by the Federal Board for Vocational Education, Washington, D. C. This is a second bulletin in the commercial field issued by the Federal Board as a part of the projects carried out in cooperation with the national trade associations in promoting organized educational programs for men in these occupations. It is intended to extend vocational education into new fields as it marks the beginning of organized vocational education in the laundry industry and is the first application of the fundamental principles of vocational education in the field of salesmanagement.

New Health Book for Schools. The school health service of the Quaker Oats Company of Chicago, Illinois, has announced the publication of a new book, entitled "Grain Through the Ages," by Grace T. Hallock and Thomas D. Wood. This second book, which follows the former text "Hob o' the Mill," is intended for the use of pupils in the seventh, eighth, and ninth grades. The book offers a fascinating story covering the history of grains through the ages and is an important addition to the school-health literature of schools. Principals and teachers may secure a copy of the book, without charge, for the use of their pupils, if they will address the Quaker Oats Company, school health service, 80 East Jackson Blvd., Chicago, Illinois.

Reorganization of School Shops. Paper, 25 pages; price, 10 cents. Wm. T. Bawden. Report of the sixteenth annual manual-arts conference of the Mississippi Valley states held at the University of Chicago in December, 1925. Copies may be obtained from Mr. W. T. Bawden, board of education, Tulsa, Okla. The pamphlet discusses individual instruction sheets, management of the school shop, objective tests in manual arts, and preparation of teachers for the general shop.

Significance of the Manual Arts in the Junior-High-School Program. Paper, 31 pages; price, ten cents. Wm. T. Bawden. Report of the eighteenth annual manual-arts conference of the Mississippi Valley states, held at the University of Chicago in December, 1927. Copies may be obtained from Mr. W. T. Bawden, board of education, Tulsa, Okla. The pamphlet discusses the relation between vocational education and manual arts, the use of individual instruction sheets, shop planning and equipment, practice teaching, and vocational guidance.

NEWS AND NOTES

Manual-Arts Teachers of Southern West Virginia Hold Meeting. The manual-arts teachers of the southern section of West Virginia held a meeting on May 5, at Huntington. Mr. C. L. Wright of Huntington, gave the welcoming address. Dr. Rosenheim, of the Huntington chamber of commerce, talked on "Condition in the Industries"; Mr. E. G. Beauchamp of Huntington, spoke on the subject, "Archery in the Schools"; Mr. W. A. Childs of Huntington, talked on "Wood Finishes." Other speakers were Mr. G. A. McGarvey, of the Federal Board for Vocational Education, and Mr. F. M. Marsh of the state education department.

At the business session, Mr. E. R. Borchardt, of Charleston, was elected chairman.

Vocational Conference at Pittsburg, Kans. The sixth annual vocational conference was held June 11 to 14, at Pittsburg, Kans. A feature of the conference this year was the round-table or group conference. Seven round-tables, for experienced, inexperienced, state supervisors, students in colleges, instructors of railway apprentices, local directors of vocational education, and foreman leaders were held.

Among those present who gave talks at the conference were Dr. C. A. Prosser, Dr. R. O. Small, Mr. C. F. Klinefelter, Mr. O. H. Day, and Mr. T. C. Gray.

Brooklyn Shop Teachers Meet. The South Brooklyn Guild of the Associated Teachers of Shopwork of New York held its May meeting at Public School 136, Brooklyn. At the meeting a general discussion of shop problems took place. Mr. Boener was elected treasurer, and Mr. Charles Frank a member of the nominating committee.

Vocational Leaders in Spring Meeting. The tenth annual meeting of the southern officials of the Federal Board for Vocational Education was held recently at San Antonio, Tex., with an attendance of 125 from twelve Southern states. Considerable attention was given at the conference to the subjects of adult education, the part-time school, the making of reports and other important problems.

Home-Economics Association to Meet at Des Moines. The twenty-first annual meeting of the American Home-Economics Association will be held June 25 to 29, at Des Moines, Iowa, with the Fort Des Moines Hotel as headquarters.

The first session of the convention will be devoted to a survey of the year's progress in the various lines of home economics. There will be ten sectional meetings, each of which will take up subjects of particular interest to teachers of home economics.

There will be two conferences in connection with the meeting, one for supervisors and teachers, and one for extension workers in home economics.

Vocational Teachers of Springfield, Mo., Hold Monthly Conference. The vocational and industrial-arts teachers of Springfield, Mo., meet regularly once a month for the discussion of topics of interest in the field. It is found that the trades and industries are common ground for the group and much help is obtained by getting together for the discussion of ways and means of getting the desired results. Eighteen teachers comprise the group and all are members of the Missouri Vocational Association.

Examination for Specialist in Home Management. The United States Civil Service Commission at Washington, D.C., has announced an examination for an extension specialist in home management to be held on June 27. The examination is to fill vacancies in the field service in argicultural extension work in the department of agriculture, and in positions requiring similar qualifications.

The position calls for a probationary period of six months and pays a salary of $3,800 a year.

Full information may be obtained from the United States Civil Service Commission at Washington, D.C., or from the secretary of the civil service board of examiners at any post office or customhouse in the country.

Civil Service Examination. The United States Civil Service has announced an open competitive examination for an assistant in personal research to be held not later than June 26. The examination is to fill vacancies in the research division of the civil service commission in Washington, and in positions requiring similar qualifications.

There are three grades of assistants, with entrance salaries of $1,860 a year for grade-one positions, $2,400 a year for grade-two positions, and $3,000 a year for grade-three positions.

The duties in general will be to assist in research with a view to evaluating and improving methods of selection and placement and to develop new technic in the construction and standardization of improved examinations and tests for entrance to and promotion in the Federal service. The competitors will be rated on a mental test, and on their education and experience.

Full information may be obtained from the United States Civil Service Commission at Washington, or from the secretary of the civil service board of examiners at any post office or customhouse.

Examinations for Warder (head of cottage), warder (housekeeper), and warder (relief class), will be held by the U. S. Civil Service Commission at Washington, D. C., on June 29. The examinations are to fill vacancies in the Federal industrial institution for

(Continued on page 34a)

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(Continued from page 33a)

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Full information may be obtained from the U. S. Civil Service Commission at Washington, D. C., or the secretary of the civil service board of examiners at the post office or customhouse in any city.

How the Washington Junior High School, Cincinnati, Ohio, Prepares Boys for Industry. The directors and principals of the Cincinnati public schools, and members of the faculty of the College of Education recently visited the Washington school to study and observe the progress made under Principal Porter with the specialized and intensified vocational program carried on in the school.

At the Washington school, boys with a mechanical trend, if destined for the shop, are given training along mechanical lines. The board of education recently purchased a large industrial building with 31,000 sq. ft. of floor space. With the enlarged facilities of this plant, the board is enabled to offer to boys an opportunity to make specialized and intensive preparation for industry. Although there is a heavy demand for the facilities, the school has been able to double its enrollment without discomfort.

After spending an hour in the shops, the school officers gathered in an auditorium conference, where Supt. Randall J. Condon explained the significance of the Washington school-shop activity. Mr. Porter, the principal of the school, also talked on the organization of the school, while Mr. E. W. Christy, director of industrial arts, pointed to the educational aims in the character of work developed at the school.

The character of the work accomplished in the Washington school is particularly approved by Supt. Condon because he is convinced that this form of work is one of the most satisfactory forms of education in Cincinnati. It appeals to a certain type of child just as an academic education appeals to another pupil. He believes that this type of education goes to the heart of the difficulty because of the response made by children to the educational opportunity offered and the workmanship attitude developed. In the opinion of Supt. Condon, no finer type of education is to be had in other lines than in this branch of school activity.

Vocational Student Completes Tenth House Plan. Mr. Benny Gordon, a student of the architectural-drafting class in the Essex County Vocational School, Newark, N. J., recently completed his tenth set of plans for a two-family house. All of Mr. Gordon's past work has been approved by the building inspection department, and many of the homes he designed are now occupied by families.

Compile Safety Rules for Machine Shop. Mr. Pfister, of the Essex County Vocational School, Newark, N. J., has recently compiled a set of safety rules to eliminate minor accidents in the machine shop. The rules have been turned over to the printshop, which will print them in quantity for use of the students. The rules are simple and easy to remember, and cover safety precautions while working on the various machines.

Electrical Laboratories Near Completion. The students of the brick and carpentry classes of the Essex County Vocational School, Newark, N. J., have nearly completed two electrical laboratories in the electric shop. The laboratories are built of 4-in. hollow tile blocks and are painted and decorated to conform with the appearance of the shop. The arrangement permits the use of classrooms within the shop, which is expected to reduce the noise between the departments and to facilitate the discipline.

Dealers and Manufacturers Cooperate in Tile Instruction. The tile dealers and manufacturers have cooperated with the Essex County Vocational School, Newark, N. J., during the past year in the donation of material for tile instruction. Much of the material was colored tile, which made possible the operation of some exceptional jobs in the evening classes of the school. The instruction this year has been largely along the line of the newer developments in tile work which involves a large amount of colored tile.

Propaganda for State Programs of Apprentice Training. Mr. S. Lewis Land, educational director for the plumbing and steam-heating associations of the United States, has begun a four-months' tour of the southern, the western, and the northern states, for the purpose of creating interest in the formation of state programs of apprentice training, journeymen training, and foreman training in the plumbing and heating industries. He is also conducting conferences of employers, journeymen, apprentices, and school representatives in the larger cities in the promotion of local programs of apprentice training. Up to the present time, he has covered the states of Alabama, Louisiana, Texas, Oklahoma, California, and Oregon, and returning will cover the states of Washington, Montana, North Dakota, Minnesota, and Wisconsin. Mr. Land's program was in most cases received favorably and he is encouraged with the enthusiastic cooperation and support which he received from industrial leaders.

Industrial-School Enrollment Increases in Oregon. Mr. O. D. Adams, state director of vocational education in Oregon, in a recent report, shows that there has been a marked increase in the

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trade and industrial program of the state educational department during the past year. During the years 1926 and 1927, the total enrollment in the trade and industrial division was 430, while this year the enrollment has increased to 1,328. While the bulk of the industrial work centers around Portland, the reimbursement is about evenly divided between Portland and the remainder of the state.

In the all-day classes, the enrollment for 1926-27 was 178, as against 218 this year. Evening classes have increased their enrollment from 42 to 172, while the enrollment in the part-time classes has increased from 210 to 638.

Carpentry, machine shop, general trades, and related drawing, attracted the largest enrollment in the all-day classes.

Enrollment in the state and Federal-aided schools has increased from 1,065 in 1926-27 to 1,149 in 1928.

Enrollment in the evening schools shows 58 persons in locomotive classes, 39 in plastering, 38 in blue-print reading, 28 in auto mechanics, and 18 in automatic airbrake control. In the other evening courses, the enrollment ranged from 5 to 20.

Prize Contest in Economics. Mr. Alvan T. Simonds, president of the Simonds Saw and Steel Company, Fitchburg, Mass., has announced the Simonds economic prize contest for 1928, which is intended to stimulate economic thinking and to increase general economic intelligence throughout the country. Up to the present, 138 replies have been obtained which are distributed as follows: Is prosperity dependent upon gold? 7; How can the cost of distribution be reduced? 64; Is advertising costing the consumer too much? 26; The economic dependence of the United States, 4; Did the United States gain or lose by the world war? 5; Can the purchasing power of the dollar be stabilized? 17; Other suggested subjects, 15. Mr. Simonds is offering this year $1,500 in two prizes of $1,000 and $500 for the best essay on an economic subject. Complete information about the contest may be obtained by writing to the Simonds Company at Fitchburg, Mass.

Offer Summer Course in Manual Training at Marshalltown, Iowa. The high school at Marshalltown, Iowa, will conduct a course in manual training during the summer months. The course will cover seven weeks and will be open to both junior- and senior-high-school students. The regular summer-school tuition fee will be charged and one credit will be allowed for the completion of the work.

Propose Erection of Trade School at St. Louis. The school board at St. Louis, Mo., has taken steps toward the erection of a trade school to cost approximately $2,500,000. Construction work will be started shortly on the first unit, which is to cost from $500,000 to $1,000,000. The school will have facilities for teaching drafting, bricklaying, printing, sheet-metal work and carpentry.

Prevocational Pupils Display Craft Work at Syracuse. Specimens of craftsmanship ranging from a drop-leaf table to lapboards, ironing boards, and tool kits, all made by prevocational pupils of the Delaware School, Syracuse, N. Y., were on display on April 14. The work was carried out entirely by pupils of the school, under the direction of Mr. Ralph G. Waring. The boys furnished their own material and were allowed to take home the finished products which they made in class.

Vocational Work in New Jersey. Of 38 full-time vocational schools in New Jersey, 15 are trade and industrial, 15 are agricultural, and 8 are home-economics schools. Instruction in manual-training subjects is given in approximately 400 public schools in 200 districts. For vocational- and manual-training work, the state of New Jersey appropriates about $900,000 annually, and the local communities expend in addition about $2,500,000 each year.

Mobile High School Graduates First Class in Vocational Work. The high school at Mobile, Ala., will shortly graduate its first class in industrial and vocational work. Eight pupils will be graduated from the two-year course in industrial education.

It is planned next year to enlarge the course to include vocational drafting. Another proposed course is a third-year course in woodworking, in which the work will include wood turning, patternmaking, advanced cabinetmaking, and operation of machinery.

The high school has a total enrollment of 550 students, of whom 240 pursue courses in some branch of the school shop department, and 300 in the mechanical-drawing classes. The applications for enrollment in the woodworking department have exceeded the capacity of the shop facilities.

Progress of Manual Training at What Cheer, Iowa. The manual-training department of What Cheer, Iowa, has aimed in all its work to develop craftsmanship along practical lines and to make the work as practical as possible. The class has made a number of furniture pieces, including floor lamps, smoking stands, end tables, medicine cabinets, ferneries, hall trees, and pedestals. The class also completed numerous art-fiber projects, consisting of sewing cabinets, footstools, smoking stands, floor lamps, and ferneries.

Vocational Courses at Ambridge, Pa. The school board of Ambridge, Pa., has added four vocational courses in the junior high school. The courses include electricity, machine-shop practice, and general industrial and woodwork, with the related subject of drafting.

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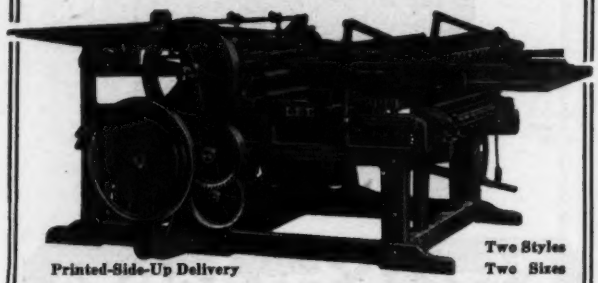

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(Continued from page 37a)

Will Build Addition to Paterson Vocational School. The board of estimate of Paterson, N. J., has been asked to approve an appropriation of $100,000 for an addition to the Paterson vocational school. The superstructure will be erected by a contracting firm, while the rest of the work will be carried out by the students and staff of the vocational school.

Brooklyn Trade School in Need of Additional Classrooms. The Brooklyn Trade School at Brooklyn, N. Y., is in need of additional classroom space. Associate Joseph Sheehan has requested that Public School 74 be partially used as an annex to the trade school. The ten classrooms which are available will materially relieve the congestion in the building.

Two New Vocational Schools in Alabama. The county board of education of Wilcox county, Ala., has selected sites for two vocational schools, one at Camden and one at Pineapple. The buildings, which will cost $61,000 each, will be ready for use in July.

Manual-Training Class Builds Voting Booths. Practical work done by the pupils in the manual-training department at Keokuk, Iowa, was splendidly illustrated when the boys turned out voting booths for the district for use at all of the elections. The booths were constructed of local materials and a local machine shop turned out the hinges. The booths were used for the first time at the annual spring election.

Conduct Model Airplane Contest at Oklahoma City. A model airplane contest was conducted at Oklahoma City, Okla., under the direction of Mr. H. F. Rusch, director of vocational work in the Oklahoma City schools. In connection with the contest, model airplane clubs were formed. The contest was arranged and supported by the local city newspaper.

Propose Cooperative Vocational Course at Drumright, Okla. Plans are being formulated for the establishment of a cooperative vocational course at Drumright, Okla. The plan provides a program of part-time education, in which pupils preparing for college will work half time and attend school half time. The program of instruction will be related to the particular field of activity for which the student is preparing. A survey of the local industries by Supt. V. C. Arnspiger lists more than one hundred occupations into which boys may enter.

Establish Library of Technical Information in Vocational School. A small library of technical and recreational books has been established in the Morton Avenue Vocational School at Albany, N. Y. The library lists 36 books on carpentry, blue-print reading, tools, radio, and invention, and every book was drawn out on the day the library was opened.

Tryout Courses Available in New Jersey Vocational Schools. Tryout courses in all subjects are available at the Essex county vocational schools in Newark, Montclair, and Irvington. Opportunities are available for entrance in the auto-mechanics, machine-shop, and the millinery classes.

Other classes which are available from the tryout groups are open to students over the age of 13 who completed the 8th grade in the grammar school, and those over 14 who have completed the 6th grade. These include carpentry, drafting, electrical work, metal work, printing, patternmaking, dressmaking, millinery, trade design, power-machine operation, and home economics for girls.

Begin Construction of Second Boy-Built Home at Akron, Ohio. The second boy-built home, sponsored by the vocational committee of the builders' exchange and the board of education at Akron, Ohio, will shortly be erected. The boy-built home project offers a splendid opportunity to boys to learn the building trade. Mr. E. C. Auten, carpentry instructor for the board of education, is in charge of the work, assisted by the teachers of electricity, sheet metal, and plumbing.

Exhibit Furniture Made by Manual-Training Students at Shakopee, Minn. An exhibit of furniture made by the boys of the manual-training department at Shakopee, Minn., was displayed in one of the local stores during the week of April 12. The pieces were well made and showed good workmanship, and attracted a great deal of attention.

Boys Build Workshop at Marysville, Texas. The boys at Marysville, Texas, recently completed a workshop for the school. The work was done by nine students, under the direction of the instructor, Mr. Dee Otts.

Wisconsin State Vocational Group Meets at West Allis. The Wisconsin State Board for Vocational Education and the state vocational directors held a joint meeting on May 14, at West Allis, Wis. The meeting was attended by 100 vocational directors and administrators from various sections of the state.

Vocational Boys Build Electrical Laboratories at Essex Vocational School. A project in building construction was recently carried out by the boys of the Essex County Vocational School at Newark, N. J., with the building of two electrical laboratories within a large electrical shop. The work of erecting hollow-tile walls was performed by the masonry department, the metal work for the doors and windows by the sheet-metal department, and the woodwork by the boys of the carpentry shop. In addition to handling the materials and doing the actual building work, the boys also prepared the working drawings for the project.